The Journal of Applied Psychology

Vol. I. DECEMBER, 1917 No. 4

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WORCESTER, MASS.

FLORENCE CHANDLER, Publisher

Entered as second class matter June 9, 1917, at the post office at Worcester, Mass. under the Act of March 3, 1879.

The Journal of Applied Psychology

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THE JOURNAL OF APPLIED PSYCHOLOGY is published quarterly. The subscription price is $4.00 a year. Single numbers $1.25. Remittances and business communications should be addressed to Florence Chandler, Publisher, Clark University, (950 Main St.), Worcester, Mass.

THE
JOURNAL OF APPLIED PSYCHOLOGY

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ESTIMATES OF THE MILITARY VALUE OF CERTAIN CHARACTER QUALITIES

By PAUL S. ACHILLES and EDITH MULHALL ACHILLES

The question of the best combinations of character qualities for success in different occupations has long been of interest, but the present necessity for thousands of men to enter a single occupation, that of soldier, lends new interest to the particular question of the best combination of traits for success in military life. Although the breadth and the many possible interpretations of this question preclude a definite answer, the widespread interest in the subject led one of the writers who was a member of the first Officers' Training Camp at Plattsburg Barracks, N. Y., to carry out the following investigation.

The list of character qualities given below was selected, and the procedure consisted in obtaining the rankings of these qualities in the order of their importance for success in military life from a large number of the men. A list of "Qualities for Rating of Executive Ability" already in experimental use by Professor E. B. Gowin of New York University for investigating their importance for business executive was chosen with a view of obtaining possible interesting comparisons. This list, with brief instructions, was printed on blanks as shown on next page, and ratings obtained from one hundred candidates and Reserve Officers attending the training camp at Plattsburg.

QUALITIES FOR THE RATING OF EXECUTIVE ABILITY

For comparison with ratings made by business men, of the following qualities in the order of their importance for success in business life, it is desired to obtain from regular army officers a rating of the same qualities in the order of their importance for success in military life. Put a "1" in front of the quality, the possession of which you consider most important; a "2" in front of the next most important, and so on until you have put a "14" in front of the least important. Consider that every man probably possesses a certain degree of each of the qualities, and rank them according to the desirability of their predominance in any given man for his success in military life.

.....**AGGRESSIVENESS**
(Energy, courage, domination by will)

.....**APPEARANCE**
(Well groomed appearance, good carriage, pleasing facial expression, voice, etc.)

.....**COMPETITIVENESS**
(Interest in playing the military game)

.....**CONTROL OF EMOTIONS**
(Freedom from outbursts of anger, touchiness, etc.)

.....**COOPERATIVENESS**
(Unselfishness, kindness, cheerfulness, tact, loyalty)

.....**INITIATIVE**
(Alertness, imagination, originality, independence in thinking)

.....**INTEGRITY**
(Truthfulness, honesty, sincerity)

.....**HEALTH**
(Bodily vigor, good sight, hearing, etc.)

.....**JUDGMENT**
(Reasoning ability, accuracy in conclusions, ability to profit by experience)

.....**OPENMINDEDNESS**
(Reasonableness, teachableness, openness to new ideas)

.....**ORGANIZING ABILITY**
(Systematizing, classifying according to functions, planning and delegating)

.....**PERSEVERANCE**
(Industry, ambition, concentration)

.....**REFINEMENT**
(Courtesy, manners, general culture)

.....**SENSE OF HUMOR**

Do the results of these rankings show any marked agreement as to the most valuable qualities for success in military life? Table 1 presents the results obtained from one hundred of the candidates and Reserve Officers at the first Officers' Training Camp at Plattsburg, May 12 to August 15, 1917. The figures under the name of the trait indicate the number of candidates placing the trait in each of the fourteen places. The sums of positions are obtained by adding one times the number of cases the trait was put in position 1, twice the number of cases it was in position 2, etc. Thus if an item had been in position 1 in each of the hundred times the sum would be 100 and if it had been in position 14 each of the hundred times the sum would have been 1,400. The range indicates the lowest and highest position in which the traits were placed. This range is great—indeed in eleven of the fourteen traits it is 1-14, the greatest possible range. There is no distinctly marked agreement as to the exact placement of the qualities. However, a glance a the sums of the positions shows a gap which divides the list in half. This may be taken to mean that the first seven qualities, as a group, are the most valuable for success in military life. The existence of this grouping seems to indicate that possession of all of these first seven qualities is about equally essential, although the part of the table showing the number of men placing each quality in each position shows a rather wide range of opinion. However, the first half of each of the first seven columns adds up to over 50 thus showing that when the table is examined by quarters, it also indicates a fair predominance in favor of these same first seven qualities as being most valuable—judgment, health, aggressiveness, initiative, integrity, organizing ability, perseverance.

It might be supposed from this wide range of opinion among the hundred embryo officers, most of them college graduates, that there is no definitely fixed common ideal gained from history and biography as to the one best combination of qualities for a successful military career. The indications from these results are rather that success in military life is open to men of all sorts of character and does not depend upon any special predominance of certain qualities. On the other hand, the lack of agreement in these results may be due, in part, to the fact that the ratings were all made by novices in the military profession.

For comparison with the above estimates made by men but little acquainted with military life, rankings were obtained from forty-two officers of the Regular Army who were in-

TABLE 1

Position	Judgment	Health	Aggressiveness	Initiative	Integrity	Organizing Ability	Perseverance	Control of emotions	Appearance	Co-operativeness	Openmindedness	Competitiveness	Refinement	Sense of humor
1	22	25	12	11	11	2	5	1	2	1	0	5	1	2
2	21	10	15	13	13	11	3	2	6	1	2	1	2	0
3	14	7	16	21	1	11	9	7	5	3	3	2	0	1
4	19	12	20	1	7	13	5	4	4	2	5	2	3	3
5	8	7	4	15	11	12	12	10	5	3	4	4	2	3
6	3	9	5	7	11	5	20	9	6	7	8	3	3	4
7	6	7	10	13	6	11	12	9	7	4	4	5	4	2
8	2	2	6	4	5	8	9	11	7	12	11	12	3	8
9	1	4	3	4	7	3	13	8	4	21	8	13	7	4
10	2	4	2	3	9	10	5	10	11	13	14	8	15	4
11	2	2	2	6	10	2	1	10	13	14	10	10	11	7
12	0	5	3	1	3	2	4	3	13	10	17	13	18	8
13	0	4	2	1	3	8	0	11	9	7	5	13	25	12
14	0	2	0	0	3	2	2	5	8	2	9	9	16	42
Sum of positions	349	406	469	491	631	635	648	828	895	913	934	948	1096	1127
Range	1–11	1–14	1–13	1–13	1–14	1–14	1–14	1–14	1–14	1–14	1–14	1–14	1–14	1–14

TABLE 2

Position	Judgment	Initiative	Integrity	Aggressiveness	Health	Perseverance	Organizing ability	Control of emotions	Cooperativeness	Refinement	Openmindedness	Appearance	Competitiveness	Sense of humor
1	12	4	12	4	6	0	1	0	2	0	0	0	0	1
2	4	6	4	8	6	5	4	1	1	1	1	1	0	0
3	8	8	4	7	5	2	3	1	2	0	2	0	0	0
4	9	6	4	2	3	9	2	4	1	0	1	1	0	0
5	1	5	1	7	8	8	4	2	1	0	2	2	1	0
6	3	4	1	3	5	6	7	3	3	0	2	4	2	0
7	2	4	5	1	2	2	5	5	6	2	2	4	2	0
8	1	2	6	5	2	4	2	2	3	3	5	4	3	0
9	0	2	2	2	0	3	3	8	3	1	5	4	8	1
10	1	1	3	1	0	0	2	7	4	4	5	3	7	3
11	1	0	0	1	3	3	1	2	7	7	4	3	8	2
12	0	0	0	0	0	0	4	4	3	7	9	10	2	4
13	0	0	0	0	2	0	3	2	4	13	3	6	4	5
14	0	0	0	1	0	0	1	1	2	4	1	0	5	26
Sum of positions	146	185.	190	202	204	234	298	350	363	365	388	397	431	539
Range	1–11	1–10	1–10	1–14	1–13	2–11	1–14	2–14	1–14	2–14	2–14	2–13	5–14	1–14

structors at the fourteen officers' training camps. The results of their ratings of the fourteen qualities are given in Table 2.

The same seven qualities appear in the first half, as in Table 1, but in a different order. Integrity, initiative, and perseverance are given more importance and health, aggressiveness, and organizing ability less. This shifting is probably due in part to individual differences rather than group differences. At first glance health seems to have been distorted in place, but further examination shows that 82% of the candidates and 80% of the officers put it in one of the first seven places—in other words, no marked group difference is present. In the second half the most striking placement is that of refinement. It is three places higher in the officers' rankings, and yet only 7% of the officers placed it in one of the first seven positions and 15% of the candidates did—thus its new position is due in part to the officers' thinking openmindedness and competitiveness less important than the candidates did. A comparison of Tables 1 and 2 shows a scattering of opinion for both groups. The range is less for the officers' group, but in both tables it is large.

The following Table 3 gives the median position for each of the qualities and their average deviation from the median. When records are at hand for other occupations besides military, a comparison will be interesting.

TABLE 3

	42 officers		100 candidates	
	Median	A.D.	Median	A.D.
Aggressiveness	4	2.48	4	2.33
Appearance	10	2.36	10	3.01
Competitiveness	10	1.83	10	2.74
Control of emotions	9	2.28	8	2.71
Cooperativeness	9	2.88	9	2.80
Initiative	4	1.93	5	2.53
Integrity	4	2.81	6	3.42
Health	5	2.48	1.5	3.82
Judgment	3	1.81	3	1.79
Openmindedness	10	2.43	10	2.56
Organizing ability	6	2.85	6	2.93
Perseverance	5	1.90	6	2.23
Refinement	12	1.69	12	2.18
Sense of Humor	14	1.17	13	2.57

As a practical matter, the forty-two Regular Army officers probably have a much more definite idea of the desirable qualities to look for in a man who is likely to succeed in mili-

tary life than have the one hundred civilians, but the present investigation fails to bring this out strikingly (1) because of its abstract nature, (2) because of the arbitrary selection and inexact definition of qualities, (3) because the same qualities are needed in many professions, and (4) because of the many possible interpretations of the phrase 'success in military life.' Very obviously success in different ranks and branches of service depends upon different qualities. A man capable of success as a private might never succeed as an officer, and similarly a man might gain immediate success as a lieutenant without possessing in sufficient degree the qualities necessary for ultimate success in the highest ranks. One lieutenant-colonel of the Regular Army placed the qualities in the following order, as being the best combination for a young lieutenant just starting his military career: Judgment, Openmindedness, Integrity, Perseverance, Aggressiveness, Initiative, Organizing Ability, Cooperativeness, Competitiveness, Control of Emotions, Health, Refinement, Appearance and Sense of Humor. A major to whom thousands of officers are indebted for their conception of the value of physical training places Health first, and the other qualities as follows: Integrity, Judgment, Organizing Ability, Initiative, Perseverance, Appearance, Aggressiveness, Cooperativeness, Competitiveness, Refinement, Control of Emotions, Openmindedness, and Sense of Humor. A Brigadier-General writes: "From the viewpoint purely of the soldier, it is not practicable to possess any of the other qualities to the desired degree, if one has poor health, as here defined. I am of course, somewhat uncertain as to the relative values to be placed on several, such as, for instance, initiative, organizing ability, judgment, aggressiveness, integrity and perseverance. They are all necessary to make the complete man, and yet I think, I have given them the relative value they should occupy." His order was: Health, Organizing Ability, Initiative, Judgment, Aggressiveness, Perseverance, Competitiveness, Integrity, Cooperativeness, Openmindedness, Appearance, Control of Emotions, Refinement, Sense of Humor.

Another officer states that the two most important qualities for an officer to possess do not appear on the list, namely leadership and ability to judge men. A fourth, a major, who has been nineteen years in service and is exceptionally well read in the lives of great military leaders, believes that very few of our Regular Army officers, much less those now hastily becoming officers, have seen enough actual warfare to adequately estimate the most important qualifications for successfully commanding troops in the field. He suggests that

the best estimation could be found in the memoirs of the great generals of history who have written of the qualities that are necessary to lead troops in battle. This is a fruitful field, and the writers regret that their lack of acquaintance with it prevents the entering of information from these sources in the present article, which must be confined to the limited data at hand. It seems possible, however, that, were a list of character qualities, such as used here, presented for rating to any number of great military leaders, a similar wide range of opinion would be found, due partly to individual differences in interpretation of both the nature of the qualities and the requirements of varying military situations, and partly to individual differences of opinion. For example, Napoleon says, "The most important quality of the soldier is his ability to support fatigue and privation; physical courage is only the second." Yet battles have been won (Montcalm at Quebec) by leaders in ill-health who have gone from sick beds by force of will. Consequently we must expect to find different importance attached to health and to each of the other qualities according to the attitude and interpretation of the man ranking them. Furthermore, very much the same qualities are needed for success in any field of endeavor.[1]

An attempt was made to see if the results of these rankings could be utilized as criteria for the qualities to look for in the selection of desirable officers and non-commissioned officers. For example, would an individual who ranked the given list of qualities in an order widely different from that given by the average show any peculiar characteristics making him unlikely to succeed in military life? Correlations between the objective order and sixteen individual rankings by the candidates were worked out. The objective order was the order of the average orders of the one hundred candidates. It was found that orders given by some of the candidates who failed to be commissioned at Plattsburg correlated higher with the objective order than many of the orders given by men commissioned as captains and lieutenants. If the objective order is taken as a standard order, then a man's estimation as to the relative importance of these qualities seems to have little or no relation to his own possession of the qualities requisite for success.

The method for estimating abilities recently described by James Burt Miner of Carnegie Institute of Technology[2] was

[1] H. L. Hollingworth. *Vocational Psychology*, pp. 98-99.

[2] James Burt Miner: The Evaluation of a Method for Finely Graduated Estimates of Abilities. *J. of Applied Psychol.*, 1917, Vol. 1, pp. 123-133.

followed in the next part of this investigation. Cards for rating individual candidates were prepared. The qualities used on the card were the five of the previous list ranked highest by Regular Army officers and by the candidates, with the addition of the sixth, Leadership. The card was as follows:

Please rate the candidate named above for the traits indicated, keeping in mind employment in military service. Give the rating independently without consulting others.

Among the members of this company the candidate would rank in which fifth? Indicate the position in each trait by placing a dot along the line, grading the candidate as finely as you can.

	Lowest 5th	Fourth 5th	Middle 5th, Av.		Second 5th	Highest 5th
Judgment.....						
Initiative.....						
Aggressiveness.....						
Health.....						
Integrity.....						
Leadership.....						

Name the highest rank which you think this candidate has the ability to attain.

State the branch of service for which this candidate seems to be best qualified.

It was planned to have twenty-five men in one platoon rate each other and themselves for possession of these qualities as compared with the other members of their company, but, owing to lack of time, it was impossible to get all of these ratings made before the commissions were announced at the close of camp. However, nine men of one platoon filled out ninety-six of the cards and the results are summarized in Table 4. The ratings cover fifteen men but are fairly comparable since nine of the men were rated by at least eight of the same nine judges. The six men marked by asterisks (*) included themselves in the ratings. Their estimates of self were uniformly higher than the average of estimates given them by their judges. To simplify the scoring the divisions on card were numbered Highest 5th to Lowest 5th 1, 2, 3, 4, 5, and a dot appearing in a division credited with the number of that division. Thus a dot appearing in Highest 5th is

scored 1, a dot in second 5th is scored 2, and so on. Hence the *smaller* the score after a man's name the more favorably he was rated. If eight men rated one candidate as being in Highest 5th in each quality, his score for each quality would be 8 and his total 6 x 8 or 48, or a 'perfect' score. To facilitate comparison, the difference between each man's possible total score and his actual total score is given; but strictly these differences are comparable only where the judges are identical and equal in number. The sections of the table to the right tabulate the answers to the request on the cards, *i.e.*, Name the highest rank which you think this candidate has the ability to attain; State the branch of service for which this candidate seems to be best qualified. The last section also shows the actual commission received at the close of camp.

Apparently for the few men covered here the ratings by these judges correspond pretty well with the selections made by the authorities at the camp on the basis of the candidates' records and the recommendations of Regular Army officers who judged the men and who observed especially their aptitude, conduct, capacity for command, military bearing, zeal, physical fitness. The impression of the writer with military experience is that usually such abstraction and refinement in rating men would be both impracticable and superfluous for the selection of non-commissioned officers in the company. Its chief advantage would be its fairness to the men and the minimizing of the partialities of those making the selections; but the company commander should deal fairly with his men, and the rough and ready tests of camp life, the drill field and the actual military situations furnish him the best basis for selection.

Although it is possible that any 'paper' test given in a few minutes will not serve to differentiate in a reliable way desirable men for leaders and responsible positions, especially in the varied requirements of military life, yet some of the standard tests do show important individual differences. The Woodworth-Wells Hard Directions test is one which has not been found to correlate very highly with scholarship, and yet it might show a certain sort of 'ability to keep one's wits' that seems necessary in military life. This test was given to twenty-eight candidates at Plattsburg. The results are shown in Table 5. The average time was 2 minutes 16.7 seconds and the average number of errors 2.4.

Apparently the test does not correlate well with that combination of abilities which make for success in military life, at least not on the basis of the selections of these men made

TABLE 4

Rating	Candidate	No. of judges	Score by qualities						Aggregate score			Highest rank able to attain								Branch		Commission
			Judgment	Initiative	Aggressiveness	Health	Integrity	Leadership	Total score	Possible score	Difference	N. C. O.	2nd Lieut.	1st Lieut.	Captain	Major	Lieut. Colonel	Colonel	General	Line	Staff	Commission received
1	We. . . .	4	5	5	5	7	4	5	31	24	7							1	3	4		Capt.
2	Rn.	3	6	6	4	5	4	4	29	18	11					3				3		Capt.
3	As.	3	4	5	10	7	3	6	35	18	17				1	2				1	2	2nd Lt.
4	Kf.	3	10	7	6	9	13	9	54	18	36		2		1					3		2nd Lt.
5	Mn.* . .	8	19	14	11	12	20	16	92	48	44				1	3		3	1*	8*		2nd Lt.
6	Ky. . . .	8	19	17	16	15	13	18	98	48	50					4	4			5	3	Capt. Ord.
7	Lg.	7	17	16	21	14	11	17	96	42	54				4	2	1			7		Aviation
8	Sn.*. . .	8	19	22	23	16	11	21	112	48	64			2	4*	2				8*		Aviation
9	Pk.	4	17	16	15	10	15	16	89	24	65	2	1		1					4		None
10	Pn.	8	19	25	30	15	12	25	126	48	78			3	3	2				5	3	2nd Lt.
11	Hd.*. . .	8	21	25	30	17	16	24	133	48	85		1	1	3	3*				6	2*	None
12	Dr.*. . .	8	26	26	26	25	22	29	154	48	106	2	1	1	3	1*				5*	3	None
13	Hw.* . .	8	24	26	29	28	19	36	162	48	114	1	2	2	2			1*		5*	3	2nd Lt.
14	Me. . . .	8	30	30	29	20	24	32	165	48	117	2	6							8		None
15	Hr.*. . .	8	28	30	31	24	24	36	173	48	125	2	3	2	1*					5	3*	None

* Self-estimated.

TABLE 5

HARD DIRECTIONS TEST

Rank	Candidate	Time seconds	Errors	Commission
1.....	Pn.....	58	2	2nd Lt.
2.....	Dy.....	77	0	Aviation(stutters quite badly)
3.....	Kh.....	81.4	1	2nd Lt.
4.....	Hs.....	88	0	2nd Lt.
5.....	Ft.....	88.6	0	None
6.....	Be.....	90	3	Q. M. 2nd Lt.
7.....	Tl.....	96	4	Capt.
8.....	Hd.....	98.4	2	None
9.....	Es.....	100	1	2nd Lt.
10.....	Ld.....	102	1	Aviation
11.....	Px.....	109.4	1	Aviation
12.....	Ky.....	114	1	Capt. Ord.
13.....	Ys.....	114	7	2nd Lt.
14.....	Wb.....	120	2	None
15.....	Ve.....	126.6	1	None
16.....	Bd.....	129	5	1st Lt. Ord.
17.....	Bs.....	135	3	2nd Lt.
18.....	Rn.....	143.8	1	2nd Lt.
19.....	As.....	156	3	2nd Lt.
20.....	Hv.....	160	2	None
21.....	Me.....	166.4	0	None
22.....	En.....	171	4	Q. M. 2nd Lt.
23.....	My.....	171.4	3	2nd Lt.
24.....	Mn.....	174	5	2nd Lt.
25.....	Rs.....	177	3	2nd Lt.
26.....	Hw.....	225	2	2nd Lt.
27.....	Dr.....	235	4	None
28.....	An.....	267.2	6	None
Average.....		136.7	2.4	

at Plattsburg, for some men who did well on the test failed to get commissions and others who did poorly were rated highly by their fellows and did receive commissions.

SUMMARY

1. Candidates for commissions differ in their opinions as to which qualities of character are most valuable in military life.

2. Officers differ in their opinions as to which qualities of character are most valuable in military life.

3. No correlation was found between those who ranked the qualities similar to the objective order and those who received commissions.

4. Judgments of associates at camp agreed fairly well with selections made by authorities.

5. Woodworth-Wells Hard Direction test did not seem to correlate well with abilities which led men to receive commissions at Plattsburg.

THE MORON AS A WAR PROBLEM

By Florence Mateer, Ph. D.,
Psychologist, Massachusetts School for Feeble-Minded, Waverley, Mass.

The question of the moron, his detection and military utilization, presented itself the moment our country began picking its defenders by a selective draft. The determination of our attitude towards him and of our use of him in the war is of practical importance. Our final decision, bringing acceptance or rejection of him as a defender of his country, will have far reaching economic, eugenic and social aspects.

All morons, as well as all defectives of lower grades of mentality, who were of draft age were registered on the fifth of June. This registration included all those who were under institutional care at that time. As the call has come, those who are in institutions have been almost automatically exempted because of the fact of their being in an institution for feeble-minded. Will all those in the community be similarly exempted when the formal examination of recruits for mental defect begins?

The disposition of all mental defectives can not be settled at one and the same time. The mentally defective person may be anything from an inert mass of flesh which cannot feed itself to a seemingly normal person whose sole difficulty is his inability "to conduct his affairs with ordinary prudence." The former would be picked out at once by any medical examiner. The latter requires every clinical device for his detection, let alone for the determination of his acceptance or rejection as a soldier or sailor.

There is as much difference between these two extremes of mental defect as there is between humdrum normality and the mentality of our greatest leaders, yet the consideration of the moron as a distinct problem is usually handicapped by the public's concept of him as merely one of the group of feeble-minded. To them a feeble-minded person is one who has a shuffling gait, crooked features, poor eyes, ears and teeth. He is a dirty, drooling, repulsive creature, needing constant care. He stares vacantly about. He must be treated just like a baby for his mentality and, consequently, his compre-

hension are those of an infant. Of course he obviously needs institutional care.

This description does not apply to the moron. Technically he has a mind which ranges from that of an eight-year-old child up to that indefinable level which just renders him deficient enough to fall below the level of those who have made good and reached normality. Actually he is different from any child after he has passed the years of his own childhood. His mind, however inferior, has had the extra ten or fifteen years which have brought him to adulthood. In that time he has gathered experience and his mind is that of an eight- or ten- or twelve-year-old *plus* adult length of experience. His reactions are necessarily different from those of a child of the same inherent mentality because of this factor of experience.

This moron group are as healthy and strong of body as the average man or woman we meet on the street. They have good co-ordination. They are athletic and physically capable. They are not often detected and placed in institutions because of physical inferiority but because of either social, moral, economic or educational difficulties. It is from these standpoints therefore that he is most apt to be a problem if he is introduced to army life.

Socially he is not likely to become a problem unless he becomes a prey to more clever men who induce him to voice their discontent or who torment him until he becomes sullen. Usually he is willing, easily interested, affable and eager to be friendly with everybody.

Morally he is apt to be a problem. He tends to be sexually promiscuous. But when we consider the enormous problem which prostitution and venereal disease raise the minute an army gathers, we doubt whether the moron is any worse in this respect than the average man, except that the moron gets caught. The same is true in regard to crime. The moron is not a born criminal. He seldom thinks up the crime for himself. He gets caught more frequently. Nor has it ever been proven that he is more given to lying or that his lying is any more chronic or malicious than that of supposedly normal people.

It is not a bad thing to know a soldier's short-comings, and one surely cannot discard the moron from our armies because of probable social or moral defects in which he is no worse than other recruits. The reason for his use or elimination must consequently be sought in his tendency to be an economic and educational failure. These two aspects of failure are really indications of the same thing. The economic efficiency of the child lies in his being the best sort of a student possible

and so using to the best advantage the opportunities for work which are opened to him. When he is through school his utilization of his chances for earning his living continues the demands made upon him. His success in both situations depends upon his learning and adapting to the situation which confronts him. The question of the moron's making good in the army or navy consequently depends upon whether he can learn what is required of him as a military unit and whether he can adapt to the daily regime.

So far as formal psychological tests go we find that the moron can learn. He is, on the average, slower in learning than the normal person and slower in adapting when the thing to be learned and adapted to is an abstract thing. But put him in a concrete situation, give him a concrete thing to learn, and there is little difference between him and a normal person. In concrete situations the defective does his best. He glories in the actual thing to be done. He can learn to drill and march, to dig, drive teams, and build. He can fetch and carry and he does it with a better will than the normal man who dreams of accomplishing more than a trivial round of chores which is never done.

The moron fits into the cogs of a big system with very little friction. He is content to eat and sleep and dress and work as a part of a machine with machine-like regularity. Such monotony he can understand and appreciate.

He does not adapt rapidly to changes which he must meet without any help from superiors. He does not have mental activity enough to attempt his own personal variation of a task which he has been taught to do in a certain fashion. He is not apt to become insubordinate unless asked to do tasks entirely too difficult for his ability. He does not worry about the future. His lack of ability to foresee and plan for the future makes him less able to imagine vividly the dangers confronting him to-morrow or next week. He is, consequently, less apt to be a prey to fear. He is content with simple amusements. He likes having a little money to spend, a good meal, a few hours off duty. He is satisfied with a minimum amount of comforts. He will do the thing he has been trained to do with stupid persistence in the face of certain death. All of these attributes seem to indicate a possibility of using the moron in the emergency we face to-day.

A present tendency is to eliminate all mental defectives, the moron included, from actual war service. This seems irrational from several standpoints.

We do not know that the mental defective will not make a

good soldier. His very stupidity makes him easily led with the group of which he is a part and there is much work to be done where numbers are as important a factor as any other. The defective probably could never be made a first-line man where the intricacies of modern warfare demand so much and such varied intelligence. He surely would do well in a "shock" regiment, however, and he could do a tremendous amount of drudgery in the camp behind the firing line. For such places as these every moron eliminated means the waste of a normal man.

But there is a far wider significance than this. The normal man goes to war, the man of low intelligence is left at home. The next generation bears the loss of the former plus the burden of the latter *and his children*. Not that defectives should be indiscriminately mixed with other men. They should be known through careful examination and then segregated. Even if not sent abroad as a whole they might be made most effective under governmental direction in this country.

The detection of morons, except perhaps the lowest ten per cent, will be by no means easy. No one criterion justifies a man's elimination unless he be markedly abnormal, and the moron is not markedly inferior in any way. A mental test alone may be theoretically correct as a means of eliminating the unfit, but we so far have no proof that there is a high correlation between ability on mental tests and ability as a man of war.

The final decision as to the use of the moron, whatever it may be, will affect the present far less than it will future generations. All issues in the struggle for the survival of the fittest will have to be fought anew under the handicaps the present war has forged. Whether we can handle the problem of the moron wisely and yet not throw further burdens on future generations remains to be seen.

A TEST FOR MEMORY OF NAMES AND FACES

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Socially as well as in business the ability to remember the names and faces of people previously met is very desirable and is sometimes absolutely necessary. The growth of practically every sales organization depends largely on repeated orders from customers who have become attached to the house through the personality of a salesman. A salesman cannot make a good impression without being able to call his customer by name, and while in making routine calls he may use a memorandum to refresh his memory on any customer whom he is about to see, such a preliminary opportunity for "coaching" is not always afforded. The customer may be met unexpectedly on a train or on the street, and an immediate introduction to a third person would require that the name be recalled at once.

No further argument is necessary to emphasize the importance of the matter and this report will present an attempt which has been made to find a means for discovering the existence of the ability in question.

The test proper consists of 100 men's pictures, approximately two inches square, clipped from a college annual, and pasted in rows on a large sheet of paper. The pictures are numbered consecutively from 1 to 100. Duplicates of 20 of these pictures are pasted on a card of smaller size. Under each of these 20 pictures is typed one of twenty common names. No first names are used, nor are any pictures of women used. The subject is instructed as follows:

"You will be shown the pictures of 20 men for five minutes. Each man's name is under his picture. At the end of five minutes you will be shown the pictures of 100 men, among which are scattered the 20 which you saw just previously. You will be asked to recognize those 20 and to name as many of them as possible."

There is no time limit for the recognition of the faces and the recall of the names, and the subject is allowed to go over the pictures more than once. If a face is named differently at one time than at another, no comment is made and the last declaration is recorded. The subject is informed as to the number recognized and named, without regard to the number of errors.

In scoring, 5 points are allowed for each face correctly named and 1 point for each face correctly recognized and not named. This gives a possible maximum of 100 points. One point is deducted for each false recognition. In further work 20 recognitions will be allowed without penalty for errors. On the original basis the scores for 72 subjects varied between 10 and 92.

The first question is in regard to the reliability of the test, and to measure that it was repeated on 33 subjects after an interval of not less than one week. The subjects were psychologists and college students. In the second trial a different selection of 20 pictures was used, and with names different from the original. The Pearson correlation between the scores in the two trials was .78. In the second trial there was occasional evidence of greater confidence and other slight adaptation to the work so that the median rose from 37 in the first trial to 43 in the second. On the whole however, the performances were quite consistent with each other.

Compared to the work of some other experimenters, the relation between recognition and recall is here quite high, the Pearson coefficient for 50 cases between recognition and recall of names being .61. There is here of course a high degree of association between the two.

The next step is to discover what relation, if any, ability in the test bears to ability in actual life. Before each subject was tested he was asked to state his conception of his own ability to remember people whom he met. In three cases of exceptionally high known ability and in one case of exceptionally low ability, there was perfect agreement with the test. In most of the other cases modesty, or over-confidence in the natural manner of expression, or ignorance due to lack of attention to the matter reduced each statement to a level, which as an indication of ability was without significance. In about 90% of the cases the answer was: "I'm not very good at remembering people's names; I can remember their faces much better."

To get a measure of ability in actual practice ten members of the psychology department of the Carnegie Institute of Technology who had taken the test were introduced under experimental conditions to seventeen students who were strangers to them. The attempt was made to have conditions as nearly as possible duplicate an actual situation,—as for instance a reception. The strangers (students) were given arbitrary names, selected for frequency in ordinary life. The ten psychologists stood in line. A stranger was introduced to the person at the head of the line, and they engaged

in the ordinary form of pleasant conversation. At the end of one minute psychologist number 1 introduced the man talking to him to psychologist number 2, and then the second stranger was presented to number 1. This was continued at one minute intervals until all the students had been introduced. As soon as a student completed his one minute with the last psychologist he passed out of sight into an adjoining room. When all the students had been through this process a visible number was pinned on the coat of each, the psychologists provided with paper, and the two groups thrown together. The psychologists re-engaged the students in light conversation and endeavored to recall the names and enter them, numbered, on the paper which they carried. A very cordial spirit of experimental honesty naturally was maintained by the psychologists. As much cannot be said for the students who were asked to go through the corresponding performance of recalling the names of the psychologists. In view of the fact that they failed to observe the proper spirit their records were discarded.. The records of the psychologists are as follows:

	Rank in Test			Rank with People
	1st trial	2nd trial	Combined	
A	1	3	1	1.5
B	2	2	2	1.5
C	3	4	3	3
D	4	8	6	6
E	5	5	5	9
F	6	1	4	7
G	7	7	7	4
H	8	9	9	8
I	9	6	8	5
J	10	10	10	10

There is of course a very considerable difference between associating names with pictures, and meeting a number of strangers and keeping their names in mind. The social factor in the latter case is very prominent and if a person is so constituted that the temporary balance of the mental factors involved is slightly disturbed thereby, then his memory for names will be comparatively much less effective than his memory under different circumstances. Such a change is noticed in subjects E and F, who drop from ranks 5 and 4 with the pictures to 9 and 7 with the people. Personal acquaintance with the subjects gives the explanation suggested above, as it does also the rise in rank of subjects G and I. G and I might be considered rather social than studious, while E and F are just the opposite.

The agreement between the test rank and the rank with

people is comparatively close, especially with the extremes. In fact it is almost too close. It is not sufficiently clear that the situation with the seventeen strange students gave a positive indication of the abilities of the psychologists, although their rank positions were approximately as each had anticipated. Further tests of the same kind are highly desirable.

A second method, and the ultimate one, for checking the test if it is to be used for selecting men for business positions, is to give it to people who have well recognized ability for remembering names and faces, and whose positions actually require it,—such as hotel clerks, office window tellers, etc. A very important difficulty of the test became apparent when it was given to a number of such people. Brief, intense study of something unusual, such as the test required, is absolutely foreign to their habits. They had all been out of school for a considerable number of years and were rather lost for a method of procedure. Artificial associations were not easily formed. In the ordinary course of their work most of the people with whom they deal are conspicuous for some particular phase of their business. There are a number of helps for placing each man. This suggested that in the twenty stimulus pictures of the test it is not enough to have simply the men's last names. Accordingly, without changing the requirements above recalling the last name only, each picture has been given a full name, the man's occupation and place of business, and the town in which he lives, as:

Fred W. Hamilton, reporter, *Evening Sun*, Buffalo, N. Y.

This method has not been tried out sufficiently to show what the results will be.

To use the test exclusively on prospective insurance salesmen it has been suggested to insert the kind of data that is most important for an agent to know when he meets a prospect; such things as age, marital condition and dependents, and occupation. A similar practice could be followed with other specialized groups.

A change in the technique has been adopted tentatively to relieve the recall of the names from dependence on previous recognition of the faces. After the twenty pictures are shown with the names, etc., the same twenty pictures only are presented, but in different arrangement, each numbered. This gives a score for the recall of names. Then for the recognition of faces those same twenty are to be identified, without naming, in a group of 100. For the present at least further study should be made on recognition at the same time as the work on recall, although later the recognition may be dropped in order to simplify the test.

MENTAL TESTS OF UNEMPLOYED MEN

By Rudolf Pintner and Herbert A. Toops, Ohio State University

Part I

The question of unemployment is one of our most serious economic and social questions. It affects not only the men that are out of employment, but indirectly society at large. Up to the present time, however, it has been treated almost entirely as an economic or social problem, and the psychological characteristics of the men who are unemployed have been scarcely dwelt upon.

The history of unemployment shows the earlier economists treating the problem with no regard to the variability of the human factor in the situation. Gradually some realization of the significance of this factor is forced upon them, but mainly from the standpoint of the efficiency of the individual, and the efficiency of the individual is even then looked upon as almost, if not entirely, dependent upon the education or the opportunity for progress that he may have. Only recently have the psychologists emphasized the importance of the mental make-up of the individual in reference to his fitness or unfitness for a place in the industrial system. As Münsterberg[1] says, "The individual needs the place for which his mental dispositions make him fit, and the work demands the individual whose abilities secure his success." Alongside of these endeavors on the part of vocational psychology to find the right man for the right place, there is evident a growing realisation of the importance of the general intelligence of the individual. This point of view is well represented in the words of Hollingworth;[2] "The first definite contribution of vocational psychology is thus not so much toward the guidance of the individual worker as for the guidance of the employer who may be required to select from a number of applicants those whose general intellectual equipment is most adequate. But we shall later have occasion to point out a further contribution which this makes possible, in so far as it may enable us to classify the operations involved in various types of work and to align

[1] Münsterberg, H. *Psychology, General and Applied.* 1914. p. 415.
[2] Hollingworth, H. L. *Vocational Psychology.* 1916. p. 79.

these operations and tasks along the general intelligence scale." The intelligence of the individual is not the only factor in the complex problem of unemployment, but it is one of the important factors, and it is with this factor alone that the present investigation deals.

Columbus, Ohio, Free Employment Office

The industrial conditions in Columbus during the time of this investigation, October 10th, 1916—March 10th, 1917, were good, in fact, no competent man willing to work had need to remain long out of employment. Owing to the war living expenses were steadily rising which had the effect of making it more necessary than in past years that each man strive to remain in steady employment if he were to secure the common necessities of life. The winter was not particularly severe, and this allowed much construction and street work to be done during the winter months. During this same winter there was an unprecedented influx of negroes from the South who were attracted by the high wages prevailing in the North. It became the duty of the employment office to place most of these colored men in positions. Nearly all were, of course, common laborers; a few were house servants, while a still smaller number were skilled workers of some sort. Considering the applicants as a whole, we believe that this period of investigation may be considered fairly representative of the normal class of applicants with which the office has to deal.

Inasmuch as no published report of any similar investigation had appeared, the methods to be used had to be devised, and even the purpose of the investigation had to be modified as the results of experimentation showed to be necessary, in order to adapt it to the ordinary routine of the office procedure and the limitations and characteristics of the men themselves. Three main lines of invesigation gradually emerged: (1) to determine the mentality of the applicants as a group; (2) to determine the mentality of the four industrial classes into which the group could be readily divided; and (3) to determine the relation of mentality to industrial, social, or educational factors. It thus became necessary first of all to collect, in the brief time allotted, as many industrial, social and educational facts as possible concerning each man, and then to determine his mentality.

The men selected for examination were chosen so as to be, as far as possible, representative of the whole group of applicants. This was necessary since it was impossible to test more than three to five per cent of the applicants applying during the

time of the investigation. In order to test representative cases, samples from the various classes in the ratio of the numbers in these classes were tested. The group was divided into three simple groups, native-born whites, colored, and foreigners. In order to determine the relative proportions of these three groups, a tabulation from the registration cards in the office was made of all new applicants registering during the period of May 27, 1916 to November 27, 1916, which also showed the number of cases in each of these three classes by age groups for a period of six months. Of the 3927 registrations during this period 10.4 per cent or 408 registrations were not included due to lack of information about them. The distribution of the 3519 remaining cases shows that the proportions of the three classes are roughly as follows: 1 foreigner: 5 colored: 11 native whites. The ratio of our samples, then, should be in about this proportion. However, since the foreigners formed only 5.7 per cent of the total and were disributed among at least thirty different nationalities and, moreover, were handicapped by difficulties with the English language, it was decided, after testing a few of them, to disregard the group entirely. Their exclusion would have little or no effect on the total results and their inclusion would lead to many difficulties in mental testing which it is well to avoid. The foreigner does not constitute an industrial problem as far as this employment office is concerned.

Table I shows the percentage of white and colored men in each age group. This table will be used later in deciding

TABLE I

PERCENTAGE OF WHITES AND COLORED BY AGE GROUPS. MAY-NOV., 1916. COLUMBUS, OHIO, FREE EMPLOYMENT OFFICE

	Per cent	
Age	Native whites	Colored
Under 20	12.3	8.3
20-29	43.0	61.9
30-39	23.2	21.1
40-49	13.5	6.6
50-59	5.4	1.7
60-69	2.2	0.4
70-79	0.1	0.0
80-89	0.1	0.0
Total	99.8	100.0

whether or not the men selected for the tests are representative of all applicants as to age. Another tabulation of the

grade at which all applicants left school when compared with the report of the selected applicants will give us another check on the reliability of our selection. Again, one should examine as large a group as possible in order to get an accurate distribution. And finally, one may decide whether or not enough cases have been examined by re-calculating the median each time a new group of cases has been added. If a point is reached where the median is not changed by the inclusion of additional data, then in all probability the number of cases is sufficient. The cases for examination, then, were chosen at random roughly in the proportion of five negroes for every eleven native-born whites and without consideration of age, education, and other characteristics. We may reasonably expect these to distribute themselves normally if we take our cases in the proportions given above.

Each man selected for examination was first questioned as fully as the time and his willingness to cooperate would allow in regard to himself, his work, past career and future hopes. An outline form was used in order to secure uniform information in regard to all men tested. The outline was not strictly adhered to, but used mainly as a means for securing definiteness and uniformity in the questioning. The data regarding name, registration number, age, color, birthplace, marital condition, grade at leaving school, occupation and best job were secured for practically every person examined. In addition, the industrial class to which each man was assigned, was decided by reference to his account of his past career and by conference with the superintendent of the office. In the same way any other information given by the persons examined was checked up and augmented, wherever possible, by conference with the superintendent or clerks in the office. The data collected are, we believe, for the most part accurate, as the examiner tried to have the subject fully understand that misleading or untrue statements would not be to his advantage in any way. Arguments similar to the following were frequently used to secure this result: "I have asked you to come in here in order that I may find out more about you. The office wants to know more about the men who apply for work. These questions may never do you any good at all, but sometime they may aid the young fellows who are just starting out to work. So if you are willing to help some other fellow who will want a job at some future time I shall be glad to get the facts concerning you and your work." Only two men refused to take the tests, and only one refused to complete the tests after beginning them.

The selection of tests to be used was dependent upon several considerations:

(1) They should not take much time to give. From half to three-quarters of an hour was as long as could be given to the test, including the preliminary questions.

(2) They should be tests which the men would regard as appropriate. Since the applicants were all adult men they were apt to resent being subjected to some of the childish tests of the Yerkes or Binet Scales. A test should thus be one which shows "how quickly you are able to do this." The tests should suggest nothing in the way of a mental examination, as these persons are very suspicious of anything of this sort. They do not see any distinction between a mental and a psychiatrical examination.

(3) The tests should each be short enough and have enough intrinsic interest so that the subject will keep his attention upon the work until the end of the examination. The men were not paid, so that this incentive to continued interest was lacking. This ability to keep his attention upon a task, often quite difficult, through motives other than those likely to result in monetary gain to himself, is in itself a good test of the individual's industrial worth.

After preliminary experimentation six tests were selected as best fulfilling these three requirements: the Cancellation Test, the Easy Directions Test—B, the Hard Directions Test, the Digit-Symbol Test, the Opposites Test, and the Cube Test.

The Cancellation Test is the A cancellation test.[3] The directions were simple: "I want to see how fast you can work. Take your pencil and see how many A's you can mark out, like this (illustrating the motion for the first two or three A's). Ready, go." The subject was allowed to work for one minute.

The Easy Directions Test[4] was ordinarily given next. The directions were: "Fill this blank out according to directions. Do exactly what each line tells you to do. I want to see if you can fill out the blank correctly. Take all the time you want and try to fill it out correctly." The test was thus given without a time limit. If the subject made a creditable performance on this, showing ability to read as well as to understand, he was handed the next test.

The Hard Directions Test[5] was begun by telling the subject to "do exactly with this as you did with the other. Fill it out

[3] Whipple, G. M. *Manual of Mental and Physical Tests*, p. 307.
[4] Woodworth, R. S. and Wells, F. L. Association Tests. *Psychol. Monog.* No. 57. 1911.
[5] Woodworth and Wells, *op. cit.*

according to directions." If the subject showed by these tests inability to read, he was generally tested by the Yerkes-Bridges Scale.

In the Digit-Symbol Test five minutes were allowed. The subject was made to understand the procedure before beginning the test by being allowed to fill in several sample lines. This test after experimentation was adopted in preference to the Symbol-Digit Test.

In the Easy Opposites Test one minute was allowed. The procedure was illustrated by the words "long, soft, up" and others if necessary. The subjects were told to "write as fast as you can, and if you come to a word whose opposite you cannot think of, let it go till the last so as to be able to get as many words as you can in one minute."

The Cube Test was given in the manner standarized by Pintner.[6] It was found that there was great variability in the performance of this test so that the subject was credited with the highest mental age to which his performance would entitle him on whichever of the two methods of calculating would give the higher mental age.

The directions and explanations were made as simple as possible. The test conditions were more favorable to our subjects than to the school children, whose norms are used to evaluate the results, since the children did not have the benefit of individual explanation or preliminary practice in any instance.

All blanks were scored by the standard method of scoring. The score in the Cancellation Test was the number of A's cancelled in one minute; in the Easy and Hard Directions Tests the number of directions correctly filled out according to the method standardized by Pintner and Toops:[7] the score on the Digit-Symbol test was the number of squares correctly filled out per minute, and for the Easy Opposites, the number of correct opposites written.

The several scores of each man were then turned into mental ages by comparison of the scores with the norms for school children obtained by Pintner.[8] The scores were turned into mental ages rather than percentiles, because of the lack of adequate adult norms. Percentiles would undoubtedly be better if adequate norms were available. The median of the several

[6] Pintner, R. The Standardization of Knox's Cube Test. *Psychol. Rev.*, Vol. XXII. 1915. pp. 377-401.

[7] Pintner, R. and Toops, H. A. A Revised Directions Test. *J. of Ed. Psych.* To appear shortly.

[8] Pintner, R. *The Mental Survey.* To appear shortly.

mental ages gives a mental index for the individual. These results were recorded on a card as shown here:

	1827	
John Doe	52 W.	U'ble.
	Score	M. A.
Cancell.	23	7.0
E. Dir.	12	8.5
H. Dir.	4	—8
D-S.	6.6	7.9
Opp.	5	8.5
Cube	—	—
Yerkes	—	—
Median		7.9

This is to be interpreted as follows: John Doe, whose registration number is 1827, is 52 years old, native-born white and belongs to the " unemployable " industrial class. He made a score of 23 on the Cancellation Test which credits him with a mental age of 7.0; on the Easy Directions Test he made a score of 12 which is approximately midway between the norms for 8 and 9 year old children, thus giving him a mental age of 8.5 on this test. The other tests are evaluated in like manner. The median mental age for the five tests is 7.9, which is the mental index for this individual. The median of the mental indices of any class gives the mental index for the class.

Results of the Tests

There were 94 men tested, classified according to color and nativity as follows: 50 native-born whites, 36 colored, and 8 foreigners. Six were tested on both the Yerkes and the other tests. Three were tested on the Yerkes Scale alone. Ninety-one were tested on the other tests alone. Not all of the 91 were tested on all the six tests. The number of tests used in testing any one individual depended upon individual circumstances. This, of course, makes some of the mental indices more reliable than others, since the greater number of tests used, the greater the likelihood of the index being the true index of the individual's ability.

In order to test the reliability of our sampling, the mental indices for the whites, colored, foreigners, and total were calculated after the 60th, 74th, and 91st cases respectively. These median mental ages are as follows:

	60th.	74th.	91st.
Whites	10.3	10.6	10.6
Colored	9.6	9.7	9.65
Foreign	11.0	11.0	11.0
Total	10.05	10.35	10.2

The very slight changes caused by the cases added to the original group suggests that the sampling is fairly representative of the group as a whole and is not likely to be materially changed by the inclusion of more cases.

TABLE II

DISTRIBUTION, IN NUMBERS AND PER CENT, OF MENTAL AGES OF WHITES AND COLORED, BY MENTAL AGE-GROUPS

	Number			Per cent		
M.A.	White	Colored	Total	White	Colored	Total
6	2	1	3	4.08	2.94	3.61
7	1	1	2	2.04	2.94	2.41
8	10	12	22	20.41	35.29	26.51
9	7	4	11	14.28	11.76	13.25
10	8	5	13	16.33	14.71	15.67
11	7	2	9	14.28	5.88	10.84
12	6	6	12	12.25	17.65	14.46
13	1	2	3	2.04	5.88	3.61
14	1	..	1	2.04	.....	1.20
15	..	..	..	.....	.....	.....
16	2	1	3	4.08	2.94	3.61
16+	4	..	4	8.16	.....	4.82
Total	49	34	83	99.99	100.00	99.99

Table II shows the mental ages arranged into mental-age groups. In making up this table fractions are disregarded; thus M. A. 10 will include all cases having a mental age from 10.0 to 10.9 inclusive. This table includes only native-whites and colored who were tested by the group tests alone.

The distribution in the two classes, native-whites and colored, would seem to indicate that each class is possibly made up of three fairly distinct grades of mentality, a relatively poor group, an average group and a relatively good group. The colored seem to have a smaller percentage in each of the higher groups than the whites and a larger percentage in the lowest group. Data in regard to the industrial classes to which the men belong would seem to corroborate this belief in three grades of mentality, although this is not so apparent in the case of the colored as in the case of the whites, the explanation

being that, on account of his race, a negro rarely ever rises to a position above that of a laborer.

Diagnosis

Results of the tests given to individuals who have also been tested on the Yerkes Point-Scale seem to indicate that the selected tests yield lower mental ages than the Yerkes Scale. The dividing lines between feebleminded and backward, backward and normal, etc., should therefore probably be lower than in the case of the Point-Scale. The division lines for these tests arbitrarily adopted by us[9] are as follows:

	Mental Age
Feebleminded	— — 8.9
Borderline	9.0 — 10.9
Backward	11.0 — 12.9
Normal	13.0 — 16.0
Bright	16.0 — +

All those cases that had been tested on the Point-Scale were diagnosed on the basis of that scale as the more reliable measure of their mentality. There were nine of these cases,leaving 85 who were tested only on the other tests. These nine cases were diagnosed as a result of a consideration of both the C. M. A. and the Three Per Cent Hypothesis.[10] The 85 remaining cases were diagnosed on the basis of the division lines given above. All 94 cases were then combined, using that diagnosis in each individual case which was best, i.e., based on the Point-Scale wherever that was used. The diagnosis of our entire group is shown in Table III.

TABLE III

DIAGNOSIS OF THE ENTIRE GROUP BY THE BEST MENTAL AGE OBTAINABLE

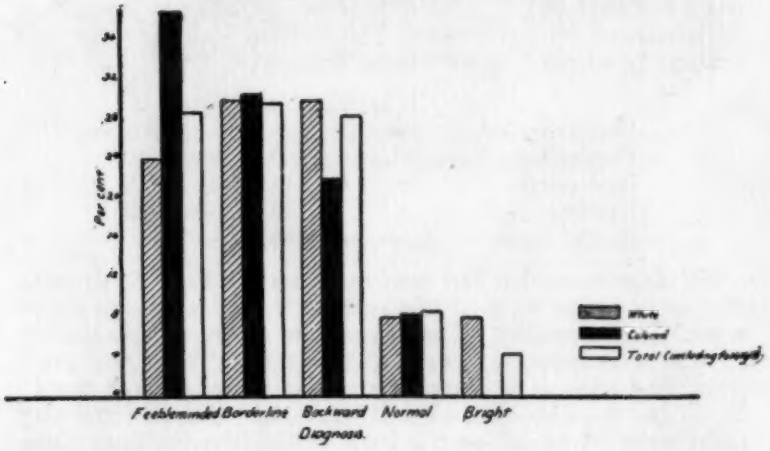
Diagnosis	Number				Per Cent			
	Total	White	Col'd	For'n	Total	White	Col'd	For'n
F.M.	27	12	14	1	28.7	24.0	38.9	12.5
Border line	28	15	11	2	29.8	30.0	30.6	25.0
Backward	27	15	8	4	28.7	30.0	22.2	50.0
Normal	8	4	3	1	8.5	8.0	8.3	12.5
Bright	4	4	..	..	4.3	8.0	....	....
Total	94	50	36	8	100.0	100.0	100.0	100.0

[9] Pintner, R. and Toops, H. A. A Mental Survey of a Workhouse. *J. of Delinquency*, Vol. 2, No. 5, 1917, pp. 278-287.

[10] Pintner, R. and Paterson, D. G. A Psychological Basis for the Diagnosis of Feeblemindedness. *J. of Criminal Law and Criminology*, Vol. VII, 1916, pp. 32-55.

The percentage distribution of these cases by color and nativity groups as well as the total distribution are shown in Graph I. We note the greater proportion of feeblemindedness among the colored than among the white. The colored have no representative in the bright group.

GRAPH I. PERCENTAGE DISTRIBUTION OF CASES ACCORDING TO MENTALITY GROUPS. COLUMBUS, O.



Mentality and Industrial Class

The relation of mentality to the industrial class to which an individual belongs was studied. This part of the investigation throws much light upon the question: what sort of an industrial career may we expect of individuals with different degrees of mentality under conditions prevailing at present?

Our 94 cases may be divided into four industrial classes which are fairly distinct and well defined. The basis for the classification is the length of time an individual is habitually employed. The classification is thus an arbitrary one and the data for determining to which class an individual belonged had to be collected by questioning the applicant, confirmed in many cases by the judgment of the superintendent of the office. The four classes with a definition of each are as follows:

(1) The Unemployed: men who habitually work on permanent or steady jobs but who, for the time being, happen to be out of work.

(2) Casuals: men who habitually work only long enough to get sufficient money to tide them over until it again becomes

necessary to work in order to maintain a mere existence. Hoboes, vagabonds, and others are included in this class.

(3) Odd Jobs: men who work fairly steadily upon short time jobs. Day work is the most common occupation of this class.

(4) Unemployables: men who are on the lowest verge of the margin of industry, men who never get a job unless there is great demand and unless there are no better men willing to take their places. Many of this class depend mostly or wholly upon charity for their support.

The first four lines of Table IV show the distribution of our

TABLE IV

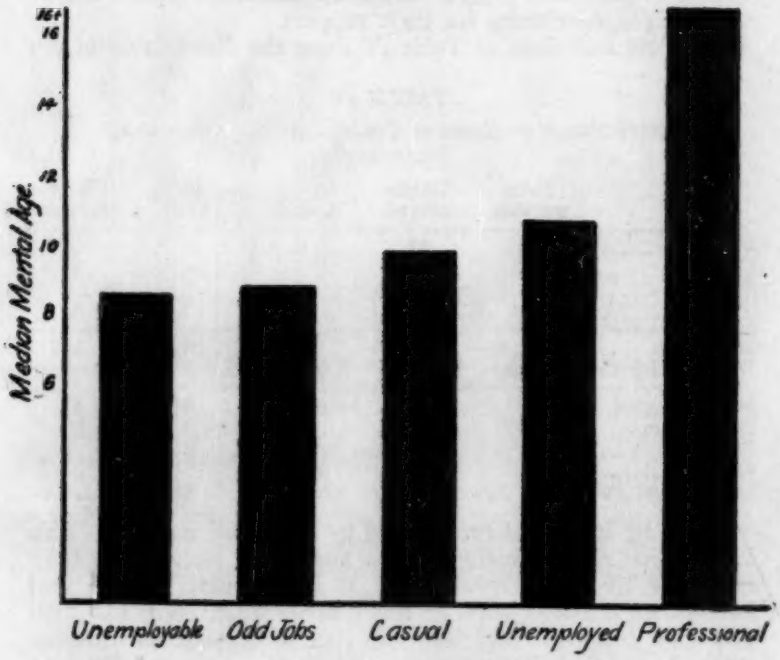
DISTRIBUTION OF CASES BY COLOR AND NATIVITY, AND BY MENTALITY

	Total number	Unemployed	Casual	Odd jobs	Unemployable
White	50	32	6	7	5
Colored	36	30	1	4	1
Foreign	8	6	1	1	..
Total	94	68	8	12	6
Med. M.A.	10.55	10.9	10.0	9.0	8.7
Range of M.A's.	6.0–16+	8.2–16+	8.0–13.9	8.0–16+	6.0–10.0
Feeble-minded	27	15	2	6	4
Border line	28	20	3	3	2
Backward	27	24	1	2	..
Normal	8	6	2	..	..
Bright	4	3	..	1	..

94 cases by industrial groups and by color and nativity. This distribution should be regarded as suggestive rather than fully indicative of actual conditions. It is undoubtedly true that individuals are misplaced in this classification, some too high and some too low. The large number of colored unemployed is due to the fact that colored men have not as many different jobs open to them as the whites, and consequently it is rather the normal thing often to work at jobs which, in the case of the whites, would be classified as odd jobs. We should expect the total group to be divided proportionately as it is; the largest number falling into the unemployed group, followed by the odd jobs men, who most nearly resemble the first class, at least from the view of desirability as employees. The casuals are unreliable, owing to their temperamental difficulties, they easily get jobs which they soon leave, as a rule to go to some other job or some other city, often even at a lower wage than in the previous position.

The median mental age and range of mental age of the cases is shown in the next two lines of the table. Graph II shows pictorially the relation of mental age to industrial class. For purposes of contrast a group of four professional men, tested with the same tests, is also shown.

GRAPH II. MEDIAN MENTAL AGE OF THE FOUR INDUSTRIAL CLASSES. COLUMBUS, O.



The last five lines of the table give the mental diagnosis of these 94 cases by industrial class. The results show that no one mental level is monopolized by any industrial class. The unemployed have representatives in every group, although this class has distinctly more individuals in the higher mentality groups than any other industrial class. As we shall later point out, even feeblemindedness is not necessarily inconsistent with steadiness and reliability in work. The casuals rank next to the unemployed, and we have already noted that temperamental difficulty rather than feeblemindedness is responsible for their position in the industrial world. Perhaps

the mental backwardness of this class allows the bad temperamental make-up a more fertile field for bad symptoms to appear than in the case of persons of normal mentality similarly afflicted, who have inhibitions against the conduct so characteristic of the casual worker. The groups of odd job and unemployable men seem to be characterized by low grades of mentality. That other factors frequently enter is shown by the one case of a bright man, who on account of bad health belongs to the odd job class. In the case of the unemployables physical handicaps and bad health are common. These may be to some extent a logical result of mental defect in that these individuals have not enough good common sense to avoid accident or to take proper care of their health.

Mentality and Age

The distribution of mental ages by chronological age groups is shown in Table V. There is here no marked relation of age

TABLE V

MEDIAN MENTAL AGE BY CHRONOLOGICAL AGE GROUPS

Age class	No. of cases	Median mental age
Under 20	10	10.3
20-29	35	10.7
30-39	26	10.75
40-49	10	9.35
50-59	8	8.8
60 and over	3	8.9
Total	92	

to mentality. The general decrease with age might suggest that the older applicants are men, who by reason of mental defect, coupled with physical infirmity, are no longer able to cope adequately with their economic environment. Another possible explanation is that these men, by reason of their mental and physical handicaps, have not been able to amass the means necessary to provide for old age. Consequently they are left in the daily struggle for bread at an age when many of their more fortunately endowed brothers are thinking of retiring from the industrial world and living comfortably on the wealth amassed during their more capable days.

Birthplace

Out of 43 native whites, for whom we have data, only 24 were born in Ohio; and out of 35 colored only 3 were born in

Ohio. The figures in the case of the native whites indicate the tendency of this class of people to move from place to place. Many were failures from the very start of their industrial career and have since moved about from place to place with the hope that some day they would find the end of the industrial rainbow with its "pot of gold" in the shape of a good job at big pay with little and easy work. This generally turns out to be merely a vision, for the individual can never escape from the defects of his mental handicap no matter where he may go.

Occupation

The occupations of 92 men were as follows: Labor 30; Daywork 14; Shopwork 7; Porter 6; Janitor 4; Carpenter 3; Miscellaneous 28. We note that labor, daywork and trades requiring only a limited amount of intelligence are the occupations of most of our men.

Best Position

The best job ever held for at least two weeks has been reported in 83 cases. This report, of course, was made by each man with no possibility of determining the reliability of the reports, which in some cases are doubtlessly exaggerated. We note, however, that few of the men examined have ever held positions of responsibility where a high degree of intelligence would seem to be essential. The median best weekly wage of 49 native whites was $22.50; the lowest best weekly wage any one individual had ever received in his life was $9.00, the highest $50.00. This latter statement was made by a man, a roller in a rolling mill, who tested feebleminded, and is doubtless unreliable, or, if true, at least very exceptional. The median best weekly wage of 34 colored men was $15, the lowest reported being $4.25 per week, and the highest $30.

Residence

Of 50 native whites, 16 or 32 per cent had, at the time of the investigation, lived in Columbus less than one year; seven others had not lived in Columbus over 5 years. The median length of residence was 9.0 years. This shows that the office serves a considerable portion of native whites who make their home in Columbus. In the case of the 35 colored, 24 or 65.7 per cent had been in Columbus less than one year. Only six had been in Columbus over five years and none over fifteen years. The median length of residence was four months, thus indicating that the colored applicants were largely recent ar-

rivals in the city. One might easily imagine this influx of unskilled Southern negroes to be of lower intelligence than the Northern-born negroes, although we have no data to throw light upon this point.

Education

Table VI shows the distribution of 91 cases by the grade at leaving school. In most cases this "grade at leaving school" was the last grade completed in school. In some cases, however, the report is based upon the number of years the individual attended school; in still other cases the individual said he "guessed he must have quit" in such and such a grade.

TABLE VI

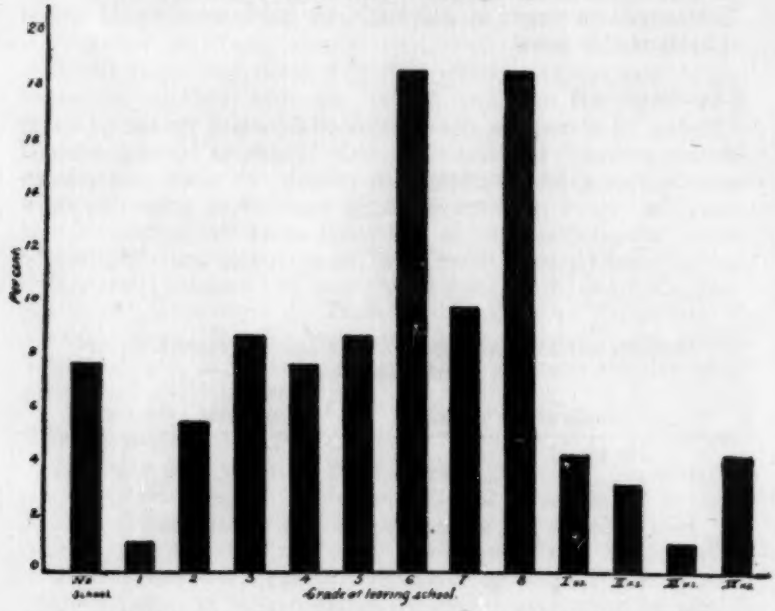
NUMBER AND PER CENT OF 91 CASES LEAVING SCHOOL AT THE SPECIFIED GRADE

Grade at leaving school	No. of cases	Per cent
No school	7	7.7
1	1	1.1
2	5	5.5
3	8	8.8
4	7	7.7
5	8	8.8
6	17	18.7
7	9	9.9
8	17	18.7
I H.S.	4	4.4
II H.S.	3	3.3
III H.S.	1	1.1
IV H.S.	4	4.4
Total	91	100.1
		Median grade at leaving
Whites	49	7.3
Colored	35	4.7
Foreign	7	6.0
Total	91	6.6

There were four colored and three foreign men who had never been to school. Of the group 39.6 per cent had not passed beyond the fifth grade in school. Twelve persons had entered high school, but of these only four had completed the high school course. Not one had even entered college.

These facts are shown pictorially in Graph III. The facts of especial note are the sudden rise in percentage at the sixth grade, the drop at the seventh, and the rise again at the eighth

GRAPH III. PERCENTAGE OF THE GROUP LEAVING SCHOOL AT EACH SPECIFIED GRADE. COLUMBUS, O.



grade. This diagram strongly suggests that the piling up at the sixth grade is due to a class of mentally defective persons who are not able to progress further in school. Concerning this point Woolley[11] says: "Two-thirds of the children leaving our public schools are the failures, and like the rest of humanity, they are tired of doing the things in which they fail."

The distribution of 91 men by school grade and by mental age is shown in Table VII. The fractions of years of mental age are disregarded. The heavy black line indicates the grade which the average child of chronological age equivalent to the mental age indicated would ordinarily have completed; thus an average child of chronological age 7 would have completed the first grade. From the table it is evident that most of the men, according to their own statements, have progressed further in school than their mentality, revealed by the tests, would warrant. We might seek an explanation in several directions:

[11] Woolley, H. T. Facts about the Working Children of Cincinnati and their Bearing upon Educational Problems. *Elem. School Teacher*, Vol. XIV, 1913, p. 135.

TABLE VII

DISTRIBUTION OF CASES BY GRADE AT LEAVING SCHOOL AND BY MENTAL AGE

Grade at leaving school	Mental Age												Total
	6	7	8	9	10	11	12	13	14	15	16	16+	
No school		1	1	1	1	2		1					7
1.....					1								1
2.....			4		1								5
3.....			2	3			3						8
4.....	1	1	2	1	2								7
5.....			4	3	1								8
6.....			8	1	2	2	1				2	1	17
7.....			1	1	2	4	1						9
8.....				3	3	3	4	1	1			2	17
I H.S..			1			3							4
II H.S..						1		2					3
III H..S.						1							1
IV H.S..					1		1	1				1	4
Total....	1	2	23	13	14	16	10	5	1		2	4	91

1. The statements of the men as to the actual grade at which they left school are inaccurate.

2. The grades, as reported, do not represent nearly so high an attainment in education as the corresponding grades of to-day.

3. Mentally inferior persons may, in the past, have been quite generally pushed beyond the limit of their abilities.

4. The mental ages revealed by the tests are too low.

It is probably true that the explanation lies in a combination of the first three possibilities with a few cases in which the fourth possibility is a factor. The point to be here emphasized is the large number of poorly educated men side by side with a proportionately large number of more or less mentally deficient.

(To be continued)

AVOCATIONAL GUIDANCE IN MUSIC

CARL E. SEASHORE, State University of Iowa

It may be appropriate to allow the term, avocational guidance, to make its debut in the JOURNAL OF APPLIED PSYCHOLOGY with a word of justification within a specific field. By avocational guidance we understand systematic direction of children and youth in the selection and organization of their avocational pursuits—those pursuits which they will follow, not as occupations but, as diversions and merely cultural quests.

The outstanding feature of vocational guidance is the demand for efficiency. This demand represents a very genuine need and a legitimate aim, but it does not represent the whole situation nor does it represent the highest stage of developmental aim and value. Even the pulpit to-day has as its chief message the demand for efficiency. But is it not likely that the pulpit vocational guidance, vocational selection, and all other efforts of human guidance and direction will emphasize a higher ideal in the near future—that is, the ideal of making a better man rather than a better tool? This is the principle which underlies the justification of avocational guidance. It recognizes the broader aim of self-realization with the aim of efficiency.

Most of the grounds on which avocational guidance in music can be justified are of course identical with the arguments on which we justify vocational guidance in music. First of these is the fact of individual differences. Music is perhaps one of the most striking illustrations that we have of variability in talent. Differences of 1 to 2 in physical height, weight, strength, and other physical measurements would be regarded as large. Differences of 1 to 5 in language, mathematics, history and philosophy would be large, but in music 1 to 25 or 50 or even more are not uncommon. Indeed, music is universally recognized as a gift bestowed upon different individuals in extraordinarily unequal degree. We have then the problem of rating ability in so far as it is possible in order that those interested in a given individual may know just what endowment nature has furnished as a working basis.

Such search for and rating of talent may, of course, be looked upon as a logical part of the great conservation movement in the midst of which we find ourselves. We thought at first of conserving our minerals, water powers, trees, animal life and other material resources, but just to the extent that our educators are awakening to the concreteness of the fact of individual difference and applied psychology is making it possible to identify, measure, and evaluate these, we are beginning to realize something of the actual relative value of such human energy as talent in comparison with the value of merchandisable goods. This point of view is simply a logical step in the recognition of psychology as a natural science, dealing with mental life as observable and controllable phenomena in nature.

Indeed, it is not out of place to speak of saving of life by such conservation, by the discovery of entirely unsuspected genuine talent and the encouragement thereof in such a way as to lead to a self-realization in a great art. Surveys of public schools which we have made recently show clearly that there is but very little correlation between the possession of musical talent and the selection of a child for a musical education; and records of the extent of a child's musical education show no close relationship to the possession of talent. There are, of course, numerous exceptions among those who have a very high order of talent, but these are relatively few in comparison with the number of actually talented. On the other hand there is also a literal saving of life if a youth who enters upon a serious musical career without natural capacity is rescued from the torture of such a career. It is perhaps not facetious to speak of alleviating human suffering, both of the prospective musician and of those associated with him. Thus, in recognizing the possibilities and worth of genuine talent and the futility of trying to make a precious metal out of a base metal, vocational guidance may be looked upon not merely as ordinary conservation but, to the extent that it deals with artistic life, there is an actual saving of the human life.

There is also the economic aspect which we cannot ignore. A statement like the following is significant.

"The editor of one of our leading music journals, with much patience and persistence, and at considerable expense and effort, has gathered statistics, for whose accuracy he vouches, which would indicate that the American people spend each year for musical education the sum of $220,000,000, not including the $7,500,000, which, until the war, was

annually spent abroad by American students. . . . We are every year spending approximately *four times as much* for musical education as for all the public high schools of the country, *nearly three times as much* as for all our colleges, universities, and professional schools, and *twenty-four times as much* as for our normal schools; or, in other words, we are spending nearly $40,000,000 a year more for musical education in this professedly non-musical country than for all high school, normal, professional, college and university teaching. Of course, I realize that Mr. Freund's figures might shrink somewhat if subjected to the same pitiless scrutiny as the government reports, but even if they should shrink one-half, they would still overlap by nearly $25,000,000 the largest item in the bill for higher education in this land." (*From the annual address of the President of the National Music Teachers' Association, December,* 1915.)

While we should not for a moment compare the economic values with the value of the artistic powers of the human personality, this economic issue is certainly large enough for the educator to ponder over.

There is no reason for limiting inventories of musical talent to children, because musicians tell us that, in this vast army of music teachers, society has but little protection against the unfit. It is a matter which lies in the distant future, but it would be reasonable to apply accurate and systematic tests to candidates for teaching positions in an art just as much as we apply them to the teaching of a science. We are, however, willing to let the committees on standards in the associations of music teachers practice first on the evaluation of talent among pupils.

Last but of first and of most basic importance for the question at issue is the fact that musical talent is surprisingly concrete, that it can be analyzed and evaluated more accurately and more easily than any other talent. It is evident that "scientific" vocational guidance undoubtedly has one of its most promising first approaches in the field of music because we deal with specific talents which can be analyzed, evaluated and often measured.

Turning then to arguments for avocational as distinguished from vocational guidance, we note, first, the fact that among those who pursue the art of music, only a small portion of individuals are going to pursue music as a profession, *i.e.*, as a vocation. The search for musical talent therefore has much larger bearing upon the selection of avocations than of vocations and the pursuit of an object for the mere pleasure

of the pursuit, as in an avocation, should be guided according to fitness and the ability to thoroughly enjoy the pursuit just as much as the pursuit of a profession.

We must also take account of the fact that those who go into a professional career most seriously are often the persons whose natural talent is so clearly outstanding that there can be but little question as to their fitness; while many persons who are not at all aware of their natural gifts in music yet could find in this art a most congenial field for self-expression, aside from a profession, are at present a dead loss to art.

Furthermore, the throwing out of test dragnets which reveal the musical talent is a most effective means for encouraging systematically the cultivation of music as an avocation. It serves the purpose of awakening latent forces for the realization of artistic activities within the community quite apart from professional careers.

Thus we may say that the field of avocational guidance is really very much larger than the field of vocational guidance in music and that it may prove an effective instrumentality in the selection and encouragement of art in the community.

Lest someone shall take fright at the danger of discouraging worthy talent, let it be said emphatically that the expert in the psychology of musical talent looks upon his mission as constructive and aggressive. He looks for talent and not for the absence of it; and where he finds talent he aims to guide it into the proper channels according to its kind and degree. It follows that incidentally the absence of talent will be discovered and occasionally it is important that such absence of talent should be known, but as a rule children have sufficient musical ability to profit by ordinary instruction both in vocal and instrumental music, and the experimenter does not consider it his mission to discourage, except in serious cases.

It is also necessary to point out to the uninitiated that when this professional guidance of music comes into general operation, it will be in the hands of musicians who are not only musicians but also technical psychologists so that they may proceed with all the instincts of the artistic sense of a musician and exercise these in the spirit of psychological procedure. There will then be no danger that the guidance will be cold or disinterested, for the guidance should wherever possible be constructive and sympathetic in the light of a genuine insight into the wonderful reach and ramifications of artistic powers.

It cannot be too strongly emphasized that just as the mere existence of law without the exercise of its force leads to law-abiding life, so the mere existence of standards for the analysis, measurement, and evaluation of musical talent will result in a general awakening on the part of the musical profession, students, and parents to the significance of these facts in such a way that each in his rôle will take common sense cognizance of them; for, after all the greatest good is not to come so much from the measurements of precision in a comparatively small number of cases but rather from the recognition of conditions now entirely overlooked but easily observable by well trained musicians.

The work being done in our laboratory and studio in the University of Iowa at the present time takes three forms. During the past year a series of tests which have been standardized were tried on under the actual school conditions in a number of public schools, principally, Charles City, Sioux City, and Red Oak, Iowa, and St. Louis, Missouri. These experiments convinced us of the feasibility of using a series of tests as a rough dragnet in the public schools, and these tests have now been adapted so as to constitute an integral part of the musical instruction in the fifth grade. The fifth grade is chosen because that is the earliest period at which the tests can be applied with safety as mass tests and because it is early enough to start the musical education of those who have been neglected up to that time.

The tests are based upon the assumption that there are three elemental capacities of hearing necessary for music, namely, the sense of pitch, the sense of time, and the sense of intensity. These are measured separately. In addition, the sense of consonance, auditory memory span, and imaginal type are determined. Each of these tests is divided into two half-hour exercises which may be scattered throughout the year. To these are added statistics about musical education, musical ratings by teachers, the general mental ability, and artistic aims and aspirations of pupils and parents. All the records are reduced to percental rank and interpreted in terms of established norms so that the records on all points are in the same terms, namely, rank expressed in per cent from 0 to 100.

The first object is to find the most promising. A separate list is made of the best 10%, and for these a definite follow-up process is instituted so that both parents and pupils shall be reached. Nearly half of this best 10% are children who have had very little or no musical training. The music

supervisor, the teacher, or the principal confers with each child at the end of the series about his record, special care being taken to encourage wherever justified and stimulate musical interest in proportion to apparent ability of the pupil. Thus, even a person who ranks 25% from the bottom is not discouraged from participating in ordinary singing and other musical exercises; but those of average ability are heartily encouraged, and those of superior ability are encouraged with enthusiasm. Those with a very poor record, if they show any interest in the subject, are re-tested to determine if the failure was due to misunderstanding or to actual lack of musical capacity.

Another feature has not yet been introduced in the schools but has been standardized so as to be introduced for all children who give high promise of achievement according to the other tests. That is a series of motor tests. Instead of testing motor capacity in music we determine the basic powers of action such as the speed accuracy and precision of voluntary movement, both in time and form, simple and complex reaction time, and timed-action. These are all measured by a single instrument of precision of remarkably simple construction and are so grouped that it is possible to get a test of all these on a single graphic record in a reasonably short time. However, since this test must be made individually it cannot be made on large numbers whereas all the other tests can be made upon groups of any size up to two or three hundred.

The giving of the tests has been so simplified by the development of apparatus and simple technique that practically any intelligent teacher can give the tests. The remaining difficulty is, therefore, that of finding persons who are sufficiently well informed to interpret the findings scientifically and in the real interest of art.

The dread of sending out an instrument of precision without any control of who is to use it or how it is to be used has made us very conservative about giving publication to these tests. At the present time the directions are available for such persons as may be qualified to use them.

As these tests are progressively introduced into the public school music of the fifth grade, we shall get a survey of the musical talent in a community. The survey is undoubtedly incomplete, but it constitutes a most excellent starting point for the cultivation of musical interests.

A second aspect of the work but one we have not attempted to push on the practical side although some progress has

been made, is the introduction of tests of this kind into the conservatories of music. Here a serious difficulty is encountered. It is not considered in accord with the ethics of the profession for the conservatory to send out dragnets for the purpose of discovering the musical talent within its constituency, and when the pupils actually arrive in the conservatory it is thought by some that it would be a serious economic sacrifice to attempt to weed out the unfit. On the other hand, it is argued that the conservatory which would set high standards by admitting only those who have natural capacity and base the training upon knowledge of such capacity would acquire a superior standing which would more than compensate for such economic loss.

The third feature which we are developing is that of consultation work. Children or those who have already made some progress in a musical career are received in the laboratory-studio and are given a thorough examination for the purpose of rating each factor in the talent. For some it is a preliminary to the entering upon a musical career, for others a means of finding out the exact nature of the handicap which has been encountered in training.

The body of our work in this pioneer field is of course still in the laboratory being a persistent effort to analyze musical talent, develop measurements, establish norms, and interpret the significance of findings for education and the art of music. The above general statement to the readers of this JOURNAL may, therefore, be regarded as a report of progress.

THEORIES OF STUTTERING[1]

By J. E. Wallace Wallin, Psycho-Educational Clinic, St. Louis

Scores upon scores of hypotheses have been advanced from time to time to explain stuttering, and the methods of treatment proposed have been equally numerous. One of the recent theories traces the affection to transitory auditory amnesia; while another theory finds the cause in unconscious emotional complexes, which may be revealed by the method of psychoanalysis (dream analysis, association tests), or in conscious mental conflicts, which, however, frequently originate in some latent complex. Special significance has been ascribed to complexes of a sexual nature and to the use of smutty or profane words.

According to the auditory amnesia or auditory aphasia theory (Bluemel[2]) the individual stutters on certain words because the auditory images of those words become temporarily weakened or are inhibited so that they do not rise in consciousness, in consequence of which the affected person is unable to recall the sounds of the words. Therefore, according to the theory, he will experience difficulty in evoking or pronouncing the words whose auditory images are weak, and this difficulty will assume the form of stuttering. Very few stutterers possess a good musical ear, which is also ascribed to the weak auditory imagery. A rush of blood to the brain when the person is excited in the presence of others, as well as cerebral anemia, is said to lower the activity of the auditory center, thereby inducing auditory aphasia. The primary cause of stuttering is the auditory amnesia. Other causes, such as bewilderment, fear, autosuggestion inhibiting the will, etc., are all secondary. They result from the primary cause. The chief aim of the treatment, accordingly, is to overcome the primary defect, the weak auditory images. The subject must have strong auditory imagery, or none at all. The training consists in attending closely to the auditory sensations. The subject must think of how the words are going to sound, he must continually recall their sounds and let the "primary

[1]We are using stuttering in the generic sense, to include stammering in the specific sense.

[2]C. S. Bluemel. *Stammering and Cognate Defects*, 1913, 2 Vols.

image" ring through the mind. The refractory images may also be awakened by acoustic sensations, especially the sound of the initial consonant. Hence the subject must begin to articulate the words even if the images are not evoked. The auditory images may also be strengthened by visual and kinaesthetic associations. In fact, the aim should be to have the visual and motor imagery eventually supplement the auditory, so that the subject may be independent of the auditory amnesia whenever it occurs. To this end he should attempt to feel and visualize the articulatory movements. He should observe the movements and positions of the speech organs of others and of himself in a mirror. So much for the auditory amnesia theory.

According to Freud[3] there is found "almost invariably" in speech disturbances a "disturbing influence of something outside of the intended speech. The disturbing element is either a single unconscious thought, which comes to light through the speech blunder, and can only be brought to consciousness through a searching analysis, or it is a more general psychic motive, which directs itself against the entire speech." In "the stammering and stuttering of embarrassment" also "it is the inner conflict that is betrayed to us through the disturbance of speech." Coriat[4] has made much of the Freudian conception. He affirms boldly that it has been demonstrated "that the psychogenesis of this disorder ("stammering") is one of the protean forms of an anxiety-neurosis or anxiety-hysteria, and not merely a tic, an obsession, an auditory amnesia or a spastic neurosis of muscular coordination." The neurosis "manifests itself mentally as morbid anxiety and a consequent dread of speaking." "The individual stammers only in specific situations or in the presence of certain individuals and then solely as the result of definite emotional reactions." "For the most part, the motivating mechanism which causes the stammering is unknown to the sufferer. . . the only conscious reaction being that of anxiety and fear." The "association tests" reveal a "form of morbid anxiety due to unconscious emotional complexes, because, as each complex is struck in the test, the typical reaction of the complex indicator follows." The complexes "lead either to no result at all or to a marked lengthening of the reaction time." "The fear in stammerers, as in all cases of anxiety neurosis, at the beginning

[3]Sigmund Freud. *Psychopathology of Everyday Life*, 1914, p. 80, 113 (Brill's translation).

[4]Isador H. Coriat. Stammering as a Psychoneurosis. *Journal of Abnormal Psychology*, IX, 1914-1915, p. 417f.

of the disorder, is merely a protective mechanism to prevent betrayal through speech, and consequently is a protector from attacks of anxiety." The stammering arises as a "defense or compensation mechanism to keep from consciousness certain painful memories and undesirable thoughts, so that they may not be betrayed in speech." "The stammerer attempts to fortify his defective speech organs, because he lays upon these organs undue emotional stress in the effort to conceal and to prevent betrayal, and thus arises the conflict between defective speech and the situations under which defective speech is most apt to occur, thus developing into morbid anxiety and fear." "The attempt to repress from consciousness into the unconscious certain trends of thought or emotions, usually of a sexual nature (libido), is the chief mechanism of stammering." "The fear in stammering is a deflection of the repressed sexual impulse or wish." "The repressed thought, because of fear of betrayal, comes into conflict with the wish to speak and not to betray. Hence, the hesitation in speech arises, and as the repressed thoughts gradually are forced into the unconscious there finally develops the defective speech automatism, either stammering or a spastic aphasia." " 'An unconscious complex crowds or presses between the syllable and the word.' " "The dread of speaking to relatives or to intimate friends may be based upon the fear that the unconscious wishes may be discovered and this stimulates the unconscious anxiety whereas with strangers speech is free, because the dread of discovery is absent." "In the large majority of cases the child did not begin to stammer until it had been talking freely and normally for several years."[5] " The speech defect arose in childhood as a type of morbid anxiety." "In adult life . . . . the dreams of stammerers are . . . . either dreams of inadequacy with efforts at compensation (not getting there, missing trains, etc.) or typical wish fulfilments, such as talking freely in company or addressing an assembly like an orator." All of the following types of repressed complexes may produce stammering:

1. "Repression of sexual acts or secrets and the fear of betrayal."

[5]On the question of the age of onset of stuttering the writer may quote from his investigation of two years ago: "If we exclude the 251 cases for which no data were supplied and base the per cents on the remaining 432 cases, we get the following results: in 81.4% of the cases the stuttering began before the age of 6 (in many of these 'at an indefinite point in early life'), and in 15% between the age of 6 and 10, and in 3.4% after the age of 10." Cf. *Report of the Board of Education of the City of St. Louis*, 1915-1916, p. 187.

2. "Oedipus complex, with a fear of betrayal of the hate of the father."

3. "Masochistic phantasies."

4. "The fear of pronouncing certain sexual, and therefore, tabooed words," relating to "certain anal, urinary or sexual functions."

5. "As a manifestation of anal eroticism."

From what has been said it follows that "the proper treatment of stammering . . . is purely psychological," namely, the removal of "the deeply rooted anxiety or dread from the unconscious, and this can only be accomplished through psychoanalysis." "The cure of stammering can be attained only through an exploration of the unconscious, a complete breaking down of resistances," "which lead to constant reversions and stickings to the infantile libido with its tendency to conceal itself," "and to a sublimation of the effort to conceal the libido in the unconscious for the pleasure desired." "Every stammerer should have a psychoanalysis, it teaches the sufferer his disturbing complexes, that is, what to avoid and what not to avoid, how to master certain situations and not be mastered by them."

In speaking of the influence of obscene words Freud says:[6] "In some forms of speech blunders we may assume that the disturbing factor is the result of striking against obscene words and meanings. The purposive disfigurement and distortion of words and phrases, which is so popular with vulgar persons, aims at nothing else but the employing of a harmless motive as a reminder of the obscene, and this sport is so frequent that it would not be at all remarkable if it appeared unintentionally and contrary to the will." According to Dunlap[7] "in many cases (not in all), the stammerer has especial difficulty with words beginning with one of a small group of sounds—the sounds with which certain obscene words much favored by small boys also begin." "The terms . . . may be in part profane expressions, or merely words like 'damn' or 'hell.'" The stammering began at the time the boy became familiar with these words "which he employed with satisfaction among his juvenile friends but which it would never, never do to let his mother, father or sisters hear." "The boy who is 'carefully brought up,' if he is handicapped by a weak constitution" or "erratic muscular activity" is very apt to become a stutterer, or a stammerer of the deadlock type." It is the

[6]Sigmund Freud. *Psychopathology of Everyday Life*, 1914, p. 96.

[7]Knight Dunlap. The Stuttering Boy. *Journal of Abnormal Psychology*, 1917, pp. 44f.

"'proper' little boys who become stutterers." "The boy in constant fear lest one of his obscene terms may slip out in wrong company . . . . soon comes to hesitate over every word which begins the same way as do these dangerous words; and as the hesitation becomes a more and more fixed habit, it extends to other types of words also." "Girls do not stutter" because they "do not develop the same fear of revealing a *tabu* vocabulary, although they may have incriminating matter to conceal, and may develop accordingly a hesitating type of stammering." In respect to the cure, "There are far safer and more effective ways of discouraging the taste for bad language than by taking the I-would-be-shocked or the it-would-break-my-heart attitude." "If your small boy commences to stutter, find out what obscene and otherwise objectionable terms the boy is apt to be using," and then tell him "(if you can truly) that you did use those or equivalent words yourself, and have stopped." "Your attitude towards him" should "be no more contemptuous, crushing or sniffling than if he should break out with measles."

We have recently attempted to make a fairly extensive study of the causation and practical treatment of a few stutterers. We here set forth the record of one of these cases, a boy of twelve, whom we had occasion to study and treat during a period of six weeks in one of the mid-western universities. The investigation of the developmental history proved negative, save for an attack of pneumonia at nine months. At eleven months the boy spoke two or three words, and at sixteen months short sentences. He began stuttering at two and a half years. The mother believes that the impediment was acquired imitatively from a maternal uncle whom he heard committing a stuttering selection at that time. He started to imitate his uncle, and gradually grew worse and more timid. At three he had his tonsils clipped. The operation frightened him greatly, and the stuttering grew worse afterwards, it is alleged. At four the tonsils and adenoid tissue were removed, and, inadvertently, a portion of the uvula. The stuttering has continued until the present time, although it has abated somewhat during the last year or two. The subject stutters little when at play with boys, or when reciting poetry, while he stutters worse when tired and when speaking in a telephone. The mother thought that the most troublesome consonants were R and M. The treatment which had been followed, consisted in an attempt to get him to speak more slowly. He had been examined by a physician who had pronounced the trouble a "purely nervous affection." He was a good sleeper,

ate well, and was not nervous, according to the mother. He had two sisters, aged 4 and 9, neither of whom had ever stuttered.

The physical examination showed that his nervous system was somewhat unstable and rather high strung. Daily observations occasionally disclosed fidgety movements, especially of the hands. He had a severe phimosis, which was corrected by an operation in the hope that the nervous tension would be lessened. According to the Stanford revision of the Binet-Simon scale the subject was advanced two months in intelligence (Basal Age IX); and according to the Seguin form-board he was advanced two years either by the combined norms or by the writer's norms for boys.[8] He had just been promoted to the seventh grade, with a condition in arithmetic and a poor record in music. He sang a few familiar songs in fair tune to the writer, but did not sustain the tones well.

The writer had twenty-three sittings with the subject during a period of six weeks, devoted in part to the investigation of the case and in part to the treatment of the stuttering. During five days of each week the special class teacher took the subject individually also for two daily lessons, following, however, only two of the methods of treatment used by the writer. In addition to this, the subject was asked to practice some of the exercises and follow many of the instructions at home.

The attempt to locate the hypothetical submerged complex by the method of dream analysis proved unavailing. During the six-week period the subject was able to recall only three dreams, although he was urged immediately to jot down his dreams whenever he awoke or whenever he could recall them. He said that he had a faint suspicion that he had one more dream, but could not recall a single fragment of it. On the sixth of the month he "dreamed that he saw a crowd of boys, representing the North and South, playing war. There were about twenty Southern and thirty Northern soldiers. The Southern soldiers were near a log cabin. Three of the Northern soldiers scared the Southern soldiers so that they ran away through the back door. I asked the Northern soldiers to catch them. Then I saw the Southern soldiers come back to the log cabin and go inside, where the Northern soldiers captured them. They put them in jail about five miles from our camp. I was near the Northern camp, and fought with the North. I shot with a gun, but did not hit anyone. I felt no fear." On the seventeenth of the month he dreamed that

[8] Table XLIX, in the writer's *Psycho-Motor Norms for Practical Diagnosis*, 1916.

he was at home, but could not recall a single detail, and six days later he dreamed that he "was home riding around in his wagon (he has a pony), and that he played hide-and-go-seek, tag, and other games with boys and had fun." He could not recall any further details. Some psycho-analyst may be able to find from these bare fragments the symbolism and the latent complex or inner conflict at the root of the stuttering. Our attempt to expound the symbolical character of these dreams to the subject and to bring the hypothetical submerged complexes into consciousness proved abortive, so far as concerns any salutary effect on the stuttering. This does not constitute a valid criticism of the method of dream analysis, because of the paucity of the dream material secured from this subject. The legitimate use of the method requires the analysis of many dreams. The method has, however, proved ineffective with two other stutterers (youths) who have reported far more dreams. These dreams have been "analyzed" independently by two students familiar with Freud's works and by myself. There is little agreement in the three analyses respecting the interpretation of the dreams or the character of the symbolism read into them. It would be profitable to subject to an unprejudiced analysis the psycho-analytic interpretations which have been offered by a considerable number of analysts who have not had access to each other's interpretations, of several extensive sets of the same dreams. The subjective, individual and fantastical nature of much psycho-analysis would in this way probably be brought clearly to light.

The results of the use of the association-reaction test was also disappointing. The stimuli which we used consisted of a series of words read aloud distinctly by the experimenter. None of the words was shown to the subject. After each word had been read, the reaction-word and the reaction-time (taken by a stop watch showing fifths of a second) were recorded. These responses are recorded in the column headed "reaction-words" in the accompanying series. After the entire series of words had been presented and the reaction-words recorded, the subject was asked to try to reproduce the same reaction-word as he had previously given as each of the stimuli-words was again read. These results are recorded in the column headed "reproduction of reaction-word." Series 2 was given eleven days after series 1, Series 3 seven days after Series 2, and Series 4 the next day after Series 3. We had in view a three-fold aim in the employment of this test. First, to bring to the surface any possible emotional complexes or

conflicts whether conscious or subconscious. The test has been used for this purpose, on the assumption that when a given word "touches" an emotional complex, or a latent complex ("complex indicator"), the reaction to the word in question, or to the following word or words, will be delayed or even blocked. By analyzing the type of words causing delayed reactions in a given series or a number of series, or interrogating the subject in connection with the words which caused delays, it is possible, according to the theory, to determine the nature of the emotional complex. Manifestly it is no easy matter to construct lists which shall contain a number of significant words, when the history of the case is negative, so far

SERIES I

Stimulus-Word	Immediate Reaction Word	Immediate Reaction Time	Reproduction of Reaction-Word	
Head	Red	2.2	+	2.8
Green	Blue	2.2	+	9.0
Long	White	2.0	+	23.0
Death	Black	5.0	+	3.0
To pay	You	7.2	He	7.8
Window	Brown	8.0	+	2.8
Father	Home	7.6	+	2.4
Lake	Blue	3.0	+	2.0
Kind	Are	7.0	Pink	16.0
Mother	Home	22.0	+	3.0
Boat	Row	2.2	+	2.0
Sister	Play	13.2	Home	2.2
Candy	Pink	3.2	+	2.0
Fall	You	8.4	He	4.0
Run	I	4.0	+	4.0
Sing	I	10.4	He	4.0
Scream	You	11.0	She	3.4
Summer	Sunshine	15.0	+	8.0
Brother	Swim	8.6	+	7.0
School	Summer	6.2	+	1.4
Nurse	The	6.2	+	2.1
Funny	Clown	11.0	+	1.4
Talk	She	11.0	I	5.2
Money	Bank	29.0	+	4.0*
Girls	The	4.4	+	4.2
Swim	You	7.2	He	3.0
Steal	He	5.0	You	5.0

The unit of measurement in all the series is seconds. A plus sign in the delayed reproduction column in all the series indicates that the word given in the immediate reaction was correctly reproduced. In the case of incorrect reproductions the wrong word is given in the reproduction column.

* The subject stuttered on all of the words marked with an asterisk (*).

SERIES II

Stimulus-Word	Immediate Reaction Word	Immediate Reaction Time	Reproduction of Reaction-Word	
Sun	Run	2.0	+	1.0
Winter	Snow	1.4	+	1.0
Desk	Brown	2.6	+	2.0
Skates	Ice	2.2	+	1.4
Jump	You	3.0	+	2.0
Ball	Hall	2.2	Fall	15.0
Pretty	White	5.0	+	2.0
Knife	Butcher	13.8*	+	6.8†
Lost	She	4.0	+	4.2
Father	Home	25.6	+	3.0
Hit	He	2.2	You	6.2
Hat	The	2.4	+	4.2
Bank	Savings	10.0	+	2.2
Scream	She	5.2	You	2.6
Pants	The	2.8	Holy	5.2†
Snow	White	5.0	+	2.4
Money	The	12.0	+	10.2
Tree	Brown	3.6	+	2.2
Death	Funeral	7.6	+	2.2
House	Black	5.2	+	4.0*
Sister	Play	7.0	+	1.6
Train	Smoky	4.2	+	11.4
Bridge	Cement	4.0	Smashed	2.0
Pump	Smashed	2.4	+	4.0
Swear	You	6.0	+	1.2

† A slight interruption occurred here.

SERIES III

Stimulus-Word	Immediate Reaction Word	Immediate Reaction Time	Reproduction of Reaction-Word	
Mill	Flour	3.2	Wind	22.2
Music	Violin	3.4*	+	4.8
River	Steamboat	4.0	Fall	2.2
Stone	Cement	4.0	+	7.0
Whistle	Boy	14.0	He	4.8
Little	Hen	4.4	+	3.0
Barking	Dog	3.4	+	5.2
Elephant	Stout	7.2	+	2.0
Calling	She	3.0	+	3.4
Rock	Fall	5.2	+	6.2
Rattling	Iron	12.0	+	3.6
Little	Sparrow	3.0	+	2.0
Mother	Home	12.4	+	1.8
Roll	Ball	5.4*	+	4.2
Kitty	Brown	5.0	+	3.4
Cry	You	10.0	They	3.0
Horse	Brown	5.0	+	1.6
Singing	She	3.0	+	8.4
With	He	10.2	You	5.4

SERIES III—*Continued*

Stimulus-Word	Immediate Reaction Word	Time	Reproduction of Reaction-Word	
Stamping	Horse	3.2	+	1.8
Noise	They	6.8	—	17.0
Shoe	Horse	3.0	+	1.8
Thunder	It	4.0	+	12.0
Fun	We	3.0	+	2.4
Shine	Shoes	3.0	+	2.0
Fool	They	7.4	You	5.2
Kiss	I	7.2	+	2.0

SERIES IV

Stimulus-Word	Immediate Reaction Word	Time	Reproduction of Reaction-Word	
Door	Floor	2.2	+	1.8
Darn	Boy	5.4	+	4.4
Fire	House	3.2	+	7.4
Arm	Strong	4.8	+	3.4
Leg	Weak*	3.4	+	2.0
Hole	Floor	4.2	+	3.6
———	Cement	6.4	Boy	6.4
He	She	3.0	Boy	15.0
Sun	Fire	5.6	+	2.4
Hell	Boy	3.8	Cement	10.0
Dig	Cement	5.6	+	6.2
———	Horse	4.6	Mule	3.6
———	Dog	5.4	+	5.2
Dam	Cement	4.6	+	4.0
Cook	Supper*	4.8	+	5.6
Girls	Bad	6.4	+	3.2
Alone	She	2.2	+	3.2
God	Heaven	13.4	+	2.2
———	Mule	6.8	+	1.6
Love	She	3.0	He	2.6
Car	Smashed	4.2	+	1.4
———	He	4.0	+	2.4
Shirt	Stripe	5.0	+	1.6
———	He	3.6	Barn	15.0
Prunes	Brown	4.8	+	2.6

as the obtained information goes, as regards occurrences which, by implication, would have caused mental conflicts, or emotional upheavals in the life of the subject. Careful inquiry of the mother (and tactful questioning of the subject later) did not disclose any grounds for such conflicts in the present instance. Arbitrary lists have in the past been constructed and these lists have been used with naive confidence in their revealing efficacy by some writers. We have included a few words from one of these lists. But to maintain that all the words in a custom-made list which are associated with delayed

responses reveal an inner conflict or emotional complex, may suffice for the unsophisticated devotee of a cult but surely cannot satisfy the critical experimental scientist[9] who demands facts capable of objective verification. We included a few words like *death, father, mother, sister, brother, nurse, girls, scream, bank, money, steal* (the father was a banker), which we thought might have been associated with unpleasant experiences in the past, and with submerged conflicts at the time. As will be seen later, some of these words produced delayed responses while others did not.

The second purpose in employing the association reaction test was to determine whether the subject stuttered because of the present or past use of indecent or profane words. The assumption made is that the subject will stutter on words beginning with the same letter as one of the foul words, and hence the record should show that the subject stuttered on such words, or that the responses were delayed. We may

[9]One is tempted to quote Solomon's stinging rebuke of some of the Freudians, in discussing the etiology of stuttering: "I must stoutly protest against an evasion of the real issues by the leaders of the Freudian movement. Let them retrace their steps and first prove the truth, soundness and validity of their psychological and sexual theories and cease pressing on to pastures new." "If they are not prepared to do this, or are unwilling so to do, I do not believe that they are entitled to continue to inflict upon others views which have little real foundation in fact, which are unproven, unfounded, purely speculative, imaginative, pure figments of the imagination, a delusion, and a snare." . . . . "Not a single case has been presented in proof of the conclusions drawn in the paper. Surely this is not what we have been accustomed to expect in other fields of medicine." "I venture to say that in no department of medicine or in fact in no other aspect of life would scientific men tolerate presentation and promulgation, despite opposition and disproof and with no tangible or definite evidence or proof." (Meyer Solomon. Remarks upon Dr. Coriat's Paper, 'Stammering as a Psychoneurosis.' *Journal of Abnormal Psychology*, 1915, 130 f.) Solomon may be interested to know that a similar vociferous "promulgation" has gone on in another phase of psychological diagnosis, the diagnosis of mental deficiency by means of mental tests and arbitrary standards the validity of which has never been demonstrated by methods which will stand a scientific test. On the basis of this procedure the public has been regaled for years with the most exaggerated statements of the prevalence and criminal menace of the feebleminded. Some workers have habitually diagnosed persons whom they have never seen (much as the mental healers diagnose and heal at a distance), on the basis of tests given by amateurs, and these results have been repeatedly referred to as "conservative" and as "scientifically demonstrated." Fortunately for clinical psychology a period of critical evaluation is setting in, the influence of a body of critical workers is gradually permeating through the ranks, and less denunciation is now heaped upon any one who ventures to question the "ipse dixit" than was the case within a period of time that is still green in memory.

also assume, according to the theory, that the subject either will stutter or the reactions will be delayed when he attempts to repeat the vulgar words themselves, or when he reacts with another word to them, because he will feel ashamed and get flustered when he hears the objectionable words. In the last association reaction test which we gave, we introduced nine inelegant or obscene words, some of which we have indicated by dashes. On the following day we asked the subject to write out a list of all the "bad," "ugly" or "nasty" words which he had ever used and also a list of indecent words which he had heard other boys use. The former list included only the word "dam fool"—the parents later said this was the only bad word they had heard him use, but it is probable that he had used others, in fact he said he had been punished for using bad words—while the list of bad words which he had heard others use included four which we used in Series IV and two which we did not use.

The third aim of the use of the association reaction test was to determine whether the subject suffered from auditory amnesia. The assumption was made that auditory amnesia should affect words whose images are predominantly auditory rather than visual or motor, and that the responses to such words should be delayed, owing to the difficulty of evoking them or the tendency to stutter on them. This assumption, it seems to us, is a natural consequence of the theory, although we would not be understood as attempting to justify it, for many persons undoubtedly visualize words which are predominantly auditory in character. It is evident, therefore, that in selecting a list of words with auditory imagery we cannot dogmatically affirm that the subject did not actually use visual or motor images rather than auditory images. But this merely proves how inherently intricate and difficult of solution this kind of a problem is.

The average and median reaction-times for the reaction-words and the later reproductions of the reaction-words in the different series are as follows:

	Series I		Series II		Series III		Series IV	
	Av.	M.	Av.	M.	Av.	M.	Av.	M.
Reaction-words	8.2	7.2	5.6	4.0	5.7	4.4	4.8	4.6
Reproduction-time	5.7	4.0	4.0	2.6	5.1	3.4	4.6	3.4

Av.= average. M.= median.

It is observed that the time for the reproductions is invariably shorter than the time for the original reactions. The responses were the slowest in Series I, for both the reaction-words and

the reproductions, while they were the fastest in Series IV, which contained the offensive words, if the results are based on the averages (one exception). Based on the general averages or medians for each series there is no evidence of delayed responses in the series containing the reprehensible words.

The following are the stimuli words which produced the slowest reaction-words in each series, together with the average and median reaction-times for the reaction-words and for the reproductions.

	Series I	Series II	Series III	Series IV
	Mother	Knife	Whistle	God
	Sister	Father	Rattling	....
	Sing	Bank	Mother	Girl
	Scream	Money	Cry	....
	Summer	Death	With	....
	Funny	Sister	Fool	....
	Talk	....	Kiss	....
	Money	....	....	....
		TIME FOR REACTION WORDS		
Average..	15.3	12.6	14.5	8.2
Median ..	12.1	11.0	10.2	6.6
		TIME FOR REPRODUCTIONS		
Average..	3.9	4.3	3.6	3.3
Median ..	3.7	2.6	3.6	2.7

The impressive point about the above figures is that while, as a matter of course, the times are invariably longer for these reaction-words than for the reaction-words in the corresponding complete series, the times are shorter for most of the reproductions than for the reproductions in the corresponding complete series. In other words, conclusions based on the time required to give the reaction-words would not at all apply to the reproduction of the reaction-words, and the question must inevitably arise which series should furnish the criterion. It has been assumed that when stimulus-words cause delayed reactions the later reproductions of the reactions will also be slower and more difficult or impossible. To be sure, the reproductions were not always correctly given for these slow reaction-words. More than half of the reproductions in Series I and III and half in Series IV were wrong, while all of those in Series II were correct. But wrong reproductions are also frequently found with rapid reaction-words. Moreover, the time for the correct and incorrect reproductions does not differ significantly. We also find instances in each series in which the

reproduction-times are slow when the reaction-times are rapid, e.g.:

	Series I	Series II	Series III	Series IV
	Kind—	Ball—	Mill*	Fire
	Green	Train	Singing	He—
	Long	....	Noise—	....
	Nurse	....	Thunder	....
		TIME OF REACTION-WORDS		
Average..	4.3	3.2	4.2	3.1
		TIME OF REPRODUCTIONS		
Average..	17.2	13.2	14.9	11.2

* Stuttered.

In only 4 of these twelve words were the reproductions incorrect. These instances are indicated by the minus sign following the stimulus word. The responses were slower for some of these incorrect reproductions, but not all. We are unable to find any "common element" that is responsible for the wrong reproductions.

An analysis of the individual words given on the previous page which produced the slowest associations shows that eight of those given on page 359 are included while three are not, namely "brother," "nurse" and "steal." The original reaction to "death" in Series II was only slightly delayed, but it was not delayed in Series I, while the reproduction times were faster than the general averages in both series. The word "scream" produced delayed associations in I but not in II, while the reproductions, although wrong, were accelerated in both series. The reaction-words to "mother" and "sister" were delayed in both I and III, and to "father" in II, but not in I, while the reproduction times are shorter than the general averages in both series. The reactions to "brother" were average. The reaction-time to "girls" was slightly delayed in IV but accelerated in I, while the reproductions were faster in both Series I and IV. The parents, however, said that the relations were not strained between them and the boy, while the boy also made the same statement, although he said that his father had sometimes punished him and he sometimes got into trouble with his sister. The word "bank" produced a delayed reaction but an accelerated reproduction in II. The word "money" produced delayed reactions in both I and II, and the reproduction was delayed in II while in I it was accelerated although the boy stuttered on the word. He was not known to have appropriated any money. The word "steal" did not produce any

delayed association, although the reproduction of the association was wrong. From this it might be inferred that the boy had had trouble with the family over money matters, although he was not known to have stolen.

The list of delayed reactions on page 361 contains a dozen words which were not included in our list on page 359. These words were given only once. The time for the reproductions of the reaction-words was less than normal for most of these words. The list includes such widely varying words as, *sing, summer, funny* (but *fun* produced an accelerated response), *talk, whistle, with* and *God*; and we do not believe that a minute analysis of these words would shed any particular light on our problem. Had the words been repeated several times they would probably have shown both delayed and accelerated responses, as did some of the other words.

The average time for the reactions to the nine obscene words in Series IV is 4.9 (median 4.6), and for the reproductions 5.8 (median 5.2). The time for the reaction-words is shorter than it is in Series I, II and III (except for the medians in II and III), and practically the same as in Series IV. On the other hand, the time to reproduce the reaction-words is consistently longer for the obscene words than for the words in any of the complete series, although the differences are sometimes negligible. It is evident that the conclusion drawn would be antithetical according as the results were based on the original reaction-words or on the reproduction times. Most workers would probably make the original response the criterion, in which case the obscene words produced a result directly opposite to that demanded by the theory. We have already called attention to the fact that the average time for the reaction-words is the shortest in Series IV. Based on the time of the responses, we find no evidence that the obscene words "touched" any submerged complex or produced any emotional perturbation when first read—the subject seemed to flush and grow slightly disconcerted only twice—while they produced only slight perturbation when read the second time. The subject did not stutter once on these reaction-words or reproductions, while six of the reproductions were correct.

It has been said that the emotional delay or blocking of the associational processes may appear only in the words which follow the exciting words. To test this theory we have averaged the time for the reaction-words to the first word following each of the objectionable words. The average is 4.3 (median 4.8), while for the reproduction of the reaction-words the average is 5.5 (median 5.2). In other words, the reaction

times are actually shorter for these words than for all of the words in any of the complete series (except for the medians). However, we again find that the reproduction times for these words are slightly longer than in the complete series, but the differences are not large.

We have also compiled the reaction rates for the words in the different series, which begin with the same letters as do obscene or inelegant words. The following figures represent the average times (in seconds) for all the stimulus words in the four series which begin with the designated initial letters (i.e., the letters which begin some obscene or profane word):

Letter	No. of words	Time for reaction words	Time for reproductions
A	3	4.6	2.7
B	7	5.1	5.5
C	7	5.1	3.6
D	6	5.1	3.6
F	8	8.7	3.5
G	4	6.6	4.6
H	8	3.5	5.9
K	3	8.6	8.7
P	5	3.7	5.7
S	19	6.3	3.1

In the main—we cannot take space to compare each initial with the average for each series given on page 360—the times are shorter for the reaction-words beginning with six of the above initials (A, B, C, D, H, and P) and longer for only four (F, G, K, S), and about the same relation holds for the reproduction series. It is evident that the results obtained from the reaction-word times and reproduction times are again contradictory for some of the words. The long reaction time which we find for the F-words is reduced to 6.3 if the word "father" is excluded in the second series, where it is abnormally long. On the whole, we do not find any greater tendency to stutter on words beginning with the initials of obscene words than on words beginning with any other letters,[10] judged by the reaction times or the tendency to stutter on the responses.

But it may be objected that the words beginning with the above initials should not have been selected from the list of stimulus words, but from the subject's responses, because it is only claimed that stuttering affects those words which are actually spoken by the stutterer and which begin with the initial of the forbidden words. To test this theory, we have

[10]Some of the words on which the subject stuttered most, beginning with the most severe, were: *little, Prentice, with, kitty, roll, rock, went, mill, river, rest, problem, cow boy, up, sixteenth, press.*

averaged the reaction times required by the subject to utter the words in the different series which begin with the initial of one of the objectionable words. The averages are as follows:

Letter	No. of words	Time for reaction words	Time for reproductions
A	1	7.0	16.0
B	17	6.8	3.9
C	6	5.9	4.5
D	2	4.4	2.6
F	6	4.6	6.4
H	16	7.9	4.9
P	3	7.8	1.9
S	23	5.1	4.3

Exclusive of the first letter, which is based on only one occurrence, the time to give the reaction-words is, on the whole, somewhat longer for four of the initials (B, C, H and P) than the subject's normal time in the four series, and somewhat shorter for three initials (D, F and S). If "home" which has an abnormally long reaction time in Series I and II is excluded the average for H is reduced to 4.1, which is less than normal. When we turn to the reproduction series, we find that the time is shorter for all the initials except F, where it is longer, and H, where it is about the same. There are a number of instances in which the wrong reproductions begin with the above initials, but they are not included in the averages. Most of them, however, show no delays.

It is evident that the results from the dream analysis and the association-test only justify a negative conclusion with respect to the causal relation of the stuttering in this case to submerged emotional complexes or the use of words which begin with the initials of vulgar words. This conclusion is in harmony with the "general impressions" which remained after a study of all the aspects of the case. The therapeutical effects of the above methods of analysis were nil. The only "complex indicator" which we could make out was possible friction of the boy in the home with the rest of the family. We pointed out to the subject how this was indicated by the tests, but, as stated above, the implication was denied. Moreover, the attempt to render the "latent" content "manifest" did not mitigate the stuttering. The boy also said that he did not have nor had he had any fear of using "bad" words in the presence of his parents or of older persons or of girls. He was told that his stuttering was due to the use of such words in as many respectable persons had used such words. He was the past, but that this was nothing to feel ashamed about now, told to stop paying any attention to this or worrying about

it, and the impression was strongly conveyed that following this advice would soon cause the stuttering to stop. We felt, however, that this line of treatment was quite impotent.

We are not yet prepared to say that the method of psychoanalysis has no value in the analysis and treatment of stuttering. There may be cases in which it is applicable. We have made an attempt to apply it, so far as our limited time has permitted, to three cases—the other two more mature than the present patient—but with unfavorable results. Naturally we have become soberly conservative with respect to the glowing claims which have been put forth in behalf of the theory. Very few of these claims have been substantiated by detailed experiments and observations and by adequate follow-up reports. Owing to the skill and the great amount of time needed to apply the method, it cannot be used, even if it were effective, in a large school system with a large number of stutterers.[11]

As we have before intimated, it is impossible to determine with absolute accuracy the type of imagery which any one may use in connection with a given word. This is particularly true when the subject finds it hard to determine introspectively what images actually appeared with different words. Our time did not enable us to secure extensive introspective data from the subject of this investigation. The data we did secure indicated that his word imagery was of the mixed type. In the following tabulation we have given the words in each series in which the imagery ought, apparently, to be predominantly auditory.

The time required to give reaction-words to these "auditory words" is the same as the normal rate in Series II (p. 360) and longer in Series I, III and IV, but the difference is negligible in III and IV. In fact, the median (4.2) for the auditory

Series I	Series II	Series III	Series IV
Sing	Scream	Music	Darn
Scream	Swear	Whistle	Dam
Talk	....	Barking	....
....	....	Calling	....
....	....	Rattling	....
....	....	Cry	....
....	....	Singing	....
....	....	Stamping	....
....	....	Noise	....
....	....	Thunder	....

[11] We have found peripheral methods more successful. The method of contracting the muscles of the lower jaw, with slow, deliberate speech, and sometimes with contraction of the hands, works fairly well with some cases, while the method of muscular relaxation and mental sangfroid gives fair results with others.

		TIME FOR REACTION-WORDS		
Average..	10.8	5.6	6.2	5.0
		TIME FOR REPRODUCTIONS		
Average..	4.2	3.8	6.4	4.2

words in Series III, which contains the largest number, is slightly smaller than the median for all the words in III. The times for the reproduction of the reaction-words are all shorter than the normal rates in all the Series except III. Seven of the seventeen reproductions were wrong, but the time was not abnormally long in these except in one instance. We cannot conclude from the association experiment that for this subject any special significance attaches to auditory words, that he suffers from auditory amnesia or that auditory amnesia has aught to do with his stuttering. While we do not consider the reaction experiment as absolutely conclusive on this point, the words on which the subject stuttered the worst (p. 364) were not auditory in character. Moreover, we explained clearly the theory of auditory amnesia and told the boy that his stuttering was due to his inability to get auditory images, and that it would disappear after he had learned to think of how the words are going to sound before he attempts to speak them. He said he thought he had been able to get auditory images of words. Nevertheless we asked him to practice daily at home (during the last three weeks) on imaging the sounds of words. In our daily exercises we also had him spend a certain amount of time in the effort to get vivid auditory images before he attempted to utter words on which he had frequently stuttered. He was frequently told to close the eyes and keep his mind on the sound of the word. If he was unable mentally to hear the sound, he was told to whisper the word. When he felt that he had a clear image of the sound he was asked to speak the word and was assured that he would be able to do so without any difficulty. These exercises seemed to lessen the tendency to stutter at the moment—possibly due to the confidence we instilled in him—but the subject continued to stutter on the same words on other occasions, and we saw no permanent improvement from the employment of these exercises within the time limits of the experiment. We felt that the subject obtained more benefit from our physical-relaxation and mental-composure exercises than from the "auditory" exercises. From our own experience with stuttering cases we feel that much more work of scientific caliber must be done before the newer theories of the affliction can be accepted as proved. This work will probably have to be done by men who come to the problem without prepossessions.

HANDWRITING DISGUISE

By June E. Downey

The determination of the extent to which handwriting may be disguised is a problem of considerable importance from at least two points of view. On the one hand, as a practical problem, of great interest from the legal standpoint, it arises in connection with the imitation of the writing of others in forgeries that are not traceries and in the "masked" writing of the anonymous letter. On the other hand, from the psychological or theoretical side, the range and method of handwriting disguise is of significance in connection with the utilization of handwriting in psycho-diagnosis.

Our concern is mainly with the second of these two considerations. In passing, however, it should be observed that the handwriting experts have much to say concerning the difficulties involved in the identification of handwriting and in the determination of the original of a disguised hand. They insist upon the need of cautious procedure; they list the sources of possible error; and they warn against the acceptance of the unsupported opinion of the incompetent and untrained witness. Mr. Albert Osborn, the New York Expert, writes,[1] "There are two main questions that confront the examiner of an alleged forgery. The first of these is how much and to what extent may a genuine writing diverge from a certain type, and the second is how and to what extent will a more or less skillful forgery be likely to succeed and be likely to fail in embodying the characteristics of a genuine writing." These two questions (1) of the limits of variation in a natural hand and (2) of the graphic characteristics that may or may not be easily assumed are of first importance from the theoretical side also.

A significant item of difference between the emphasis of the handwriting expert and that of the psychologist should, however, be noted. The expert approaches the problem largely from the standpoint of the degree of credibility of the witness testifying in court concerning the genuineness of handwriting. The psychologist would press the matter further back and

[1] "Errors in Identification of Handwriting." *Am. Law Review*, Vol. 48, 1914, p. 48.

determine, if possible, the reason for the great individual differences that exist, apart from training, with respect to observation of handwriting individuality. Furthermore, he is most curious concerning the varying capacity for disguise exhibited by different penmen and the mental temperament that lies back of virtuosity in the assumption of different handwriting individualities. Lastly, he would question what are the psychophysical factors that determine the ease or difficulty with which different graphic elements may be voluntarily altered.

The problem of control in handwriting, which is a basal one so far as psycho-diagnosis is concerned, centers about two problems both of which are open to experimentation: (1) The extent to which disguise of one's habitual handwriting is possible and (2) the extent to which voluntary control is maintained in conventional writing as evidenced by the changes that take place in automatic writing or writing under distraction. In everyday life an obvious indication of this latter change is the difference between writing furbished up for state occasions and writing designed for domestic purposes, in negligee so to speak. In ordinary writing, control becomes progressively less rigid as one becomes interested in the content of what he is writing or as speed of writing increases. The first half of each word, the first half of a written line, and of a manuscript give evidence of greater control than does the second half. The significance of this variation in conscious control, so often emphasized by graphologists, need not detain us here. Instead let us turn to the problem of voluntary disguise of handwriting.

For scientific purposes one strikes the problem at close quarters by an experimental treatment such, for instance, as that of Dr. Georg Meyer.[2] Meyer approached the question from four different angles: (1) Which graphic characters can be *repressed* voluntarily? (2) Which can be assumed *voluntarily*? (3) What is the result of a deliberate attempt to disguise handwriting? (4) How far is imitation of another hand possible?

To obtain an answer to question 1, a large number of subjects were asked to write as calligraphically as possible, in true copy-book style of the schoolroom. Normals were also obtained for comparison. To obtain an answer for question 2, definite variations in particular graphic characters were asked for from twenty-five different reagents. Question 3 was answered by asking subjects to disguise their writing;

[2] "Ueber Schriftverstellung." *Graphologische Monatshefte*, 1900, IV, pp. 1-12; 105-120; 125-139.

question 4 by asking for imitation of specific hands. From his study of the methods of intentional disguise employed by unsophisticated subjects, Meyer was able to draw some interesting conclusions concerning the graphic elements that are least subject to control, which in the main are precisely those to which the average observer pays least attention.

I have notes on an experiment of my own similar in purpose to that of Meyer but developed in a somewhat different manner.

I asked twenty-four unsophisticated subjects to write a given verse on an unlined sheet of standard size and quality in their usual manner. I then requested each of them to rewrite this verse on a second similar sheet but disguising their hand-writing as far as was possible. No instructions were given as to method of disguise. Each subject could take all the time and pains that he cared to in the disguise, which was prepared *away* from the laboratory. In selecting my subjects I chose twelve of each sex. With reference to age they fell into two groups also, twelve under twenty-six years of age and twelve over thirty. The younger group was, with one exception, composed of college students; the older group, with three exceptions, of University instructors. Four of the latter were psychologists. Such a selection of subjects was dictated by a desire to see whether age and sex were factors governing success in disguise. The degree to which a given disguise was held to be successful was determined by the submission of the series of disguised and undisguised writings to sixteen reagents for matching and the counting of the number of times a disguised specimen was correctly matched with the undisguised specimen written by the same penman.

The material obtained in this manner was worked over with the following questions in mind: (1) What methods of disguise were utilized by the group of subjects? (2) To what extent were the individual attempts at disguise effective as determined by the percentage of failures on the part of the judges in identification of the disguised hand? Were the younger penmen more successful than the older ones in disguise? Was there any difference in the percentage of successes of men and women?

In an attempt to answer the first question, out of almost numberless observations that might be made relative to changes in the graphic characters, tabulation was limited to the obvious shifts in size, slant, pressure or line-quality, form, continuity, alignment, connecting-stroke, relative proportion, and i-dot. See Table I.

TABLE I

METHODS UTILIZED IN DISGUISE OF WRITING BY 24 SUBJECTS

Number of Times There Was a Noticeable Shift In

Size, 17	Slant, 16	Pressure, 15	Form, 16	Alignment, 16	Continuity, 11	Connecting-stroke, 17	Proportion, 16	i-dot, 5
Decreased 11	To backhand or vertical 15	Increased 12	Ornamented 8	Straightened 6	Decreased 8	More rounded 12	One space letter 7	Change in form 5
Increased 6	To right 1	Decreased 3	Fantastic 2	More serpentine 4	Increased 3	More angular 5	Increased down stroke 5	In localization ?
			Simplified 6	Rising 4			Decreased down stroke 2	
				Falling 2			Increased up stroke 2	

A word of comment upon each of these chosen elements is desirable. A change in size of writing is a frequent outcome of disguise, a decrease being more common than an increase in size. There is, in fact, in the given specimens no case of increased size comparable to the extremes of decrease. The decrease in size of letters is usually accompanied by a greater compactness in texture leading to a compression in the horizontal extension. This same compression appears also in a few cases in which the writing is increased in size but, usually, increased amplitude is accompanied by a looser texture.

A shift in slant was also noticeable in the disguised hand, usually in the direction of the vertical or backhand. Such a change is one that readily appeals to the unsophisticated, although handwriting individuality is but little dependent upon slant of writing.

The degree to which pressure varied in the natural and the disguised hand cannot be told with any degree of accuracy from the written product. Experiments on pressure demand actual instrumental registration. Certain changes in line-quality were, however, very evident in a large number of cases. In a majority of specimens this change is in the direction of a heavier line. I do not find, unfortunately, a record of how many of my subjects used a different style of pen in attempting to disguise their hands, but in any case it is unlikely that such a shift accounts for the uniformity in direction of change.

In consideration of variations in letter-form, the writing-specimen was scrutinized to determine whether on the whole there was simplification or conventionalizing of the natural hand or whether the reagent attempted to disguise his hand by the employment of superfluous ornamentation or fantastic forms. Recourse to a conventional vertical hand or to print is one of the most effective means of disguise but it is more difficult to achieve than a hand decked out with all manner of superfluous curls. It demands more consistent motor control. The tabulation given overlooks the many details of form that would be so carefully noted by the expert in attempting to prove or disprove the genuineness of a given writing. Individual mannerisms, tricks of style, are often revealed in the form of individual letters and one of the most interesting questions involved in disguised handwriting is the extent to which a penman is aware of his individual peculiarities and the consistency with which he is able to avoid tell-tale mannerisms. Such observation does not, however, lend itself to tabulation. Changes in capitals are more easily achieved than changes in small letters; they are made with a higher degree of consciousness.

A change in alignment occurs frequently but without much uniformity as to the direction.

The degree of continuity in a given hand is one of its most distinctive marks. This character is held to be very largely dependent upon the general smoothness and regularity of the motor impulse, a matter to a considerable degree, of the original constitution. A break in continuity is much more easily initiated than is increased continuity.

Changes in the form of the connecting stroke occur frequently, more commonly from an angular to a rounded connection than the reverse.

While absolute size of writing is easily shifted, relative proportion of parts is pretty constant. There are, however, a very great number of possible observations relative to proportion, among them the following: relative proportion of strokes above and below the line, relative size of one-space and three-space letters, relative horizontal and vertical space relations of the one-space letters, relative proportion of capital and strokes above the line. It is much more difficult to vary some of these proportions than others. For example, from my results, it appears that a change in the relative size of the one-space letters is not infrequent, while changes in the relative proportion of up and down strokes is less often observed. An increase in the relative length of an up-stroke is said to be particularly difficult to achieve and my specimens show only two cases in which such a change was evident. An increase in the relative length of a down-stroke is much more common, and, in general, an increase in difference in length is twice as frequent as a decrease in difference in length.

The mannerisms exhibited in dotting the i are very constant. This i-dot may be observed from three points of view; its localization, that is, the distance it is placed above the line and its position directly above or to the right or the left of the i; secondly, its form, which varies in an extraordinary number of ways from comma-shaped to wedge-shaped, not to mention its size; and, thirdly, the time of its making, immediately after the letter itself or after the word or line has been written. One would need to watch the penman while writing in order to establish this latter habit. In the disguises I collected, there are no obvious changes of localization in the placing of the dot, although in several specimens there is great variability in the natural hand itself. So far as form was concerned there are several deliberate attempts to vary the form. Bizarre forms were adopted for the dot, such as the use of a circle, or of a v-shaped figure. I am inclined to think that two or three of these changes were motivated by a knowledge on the part

of the penman of the fact that the dot of an i is most characteristic.

Some of the changes just mentioned are deliberate, a revelation of what the subject believes to be characteristic of handwriting individuality. Of these deliberately sought shifts some are easily manipulated, slant, for example, and change in absolute size. Others are handled with greater difficulty because of their dependence upon psycho-physical factors, as, for instance, degree of connection. Still other changes are dependent upon the general instruction to disguise the hand and are not directly willed by the subject nor even noticed by him.

Let us be more specific. Absolute size is easily changed voluntarily. But not all changes in size are to be attributed to direct volition. Increased attention to writing results in decrease in the size of writing and in increased pressure. The uniformity with which changes occurred in these directions is then, in part at least, an outcome of effort of attention and not wholly a product of intention. Increased size, on the other hand, may result from discontinuity of the motor impulse so that each letter is written as a separate unit rather than as part of a word. One would expect to find this increase in size in disguises in which attention is concentrated upon variation in the form of individual letters. Frequent breaks in connection between letters would also result from such a break-up of the motor impulse.

Alignment and the shape of the i-dot may be deliberately varied if one chance to know his own mannerisms and if he can hold his attention consistently to the detail in question. Details of form are very hard to change particularly in the middle and at the end of a word. The style of a capital is not hard to shift.

The results of this canvass of the methods utilized in disguise of hands agree very closely with what has been reported by Meyer as the outcome of his investigation and with the scheme adopted by the Berlin police in their indexing of handwriting specimens as part of their system of identification of criminals. In this latter system the characteristics of handwriting are arranged in a descending scale beginning with the elements that are most easily altered and ending with those that are least subject to change.

A further point of interest is a comparison of these shifts that accompany an effort to disguise the hand, with concentration of attention upon the act of writing, with those that are the outcome of distraction of attention from writing and, in some instances, of completely automatic writing. The shift

in size that is significant of automatic writing has been somewhat thoroughly discussed in another connection.[3] Increase in size is a general outcome of increased automatism, just as decrease in size is an effect of concentration of attention upon writing, unless the latter result in a complete dissociation of letters and separate impulse for each. A decrease in pressure is also an outcome of automatic writing but less evidently so than the increase in size. Completely automatic writing results apparently in script that is more continuous than the usual writing but in case of incomplete distraction there would be alternate fixation and release of attention with, probably, increased discontinuity. Changes in slant do not occur in automatic writing as they do in disguised hands, although there seems to be in some cases a tendency to greater verticality. Changes in form are in the direction of disorganized or childlike hands.

Between the two extremes of voluntarily disguised writing and writing produced without conscious supervision lies the ordinary writing with which graphology deals. It is evident where one should look for lapse of control. In ordinary writing such control is greatest at the beginning of words and at the opening of a manuscript. Conventional restraint becomes progressively difficult as speed of writing increases. With deepening interest in content, writing becomes freer and bolder. Every prolonged piece of writing shows the shift from conscious to involuntary control, and in this fact the graphologist finds an opportunity for observation of certain characteristics of the motor impulse.

Let us turn now to the second question, the success of a disguise as determined by the failure of the judges in penetration of the disguise.

But before entering upon the question of the success of the individual penmen, a word concerning the varying skill of the sixteen judges. The range in success runs from only one correct identification of the twenty-four disguised hands to an accurate pairing of eleven specimens (a record made by a bank cashier). The average number of correct identifications (and the median record) is six, or twenty-five percent.

About half of the judges were taken from the college community which produced the disguised hands, and, in some cases, they recognized a number of the natural hands. This familiarity with the natural hand increased slightly the number of correct identifications. There exists, however, a very great

[3] "Control Processes in Modified Handwriting." *Psy. Rev. Mon. Sup.*, 1908, 37, p. 122f.

individual difference in the ease with which handwriting is recognized even when undisguised and in the facility with which handwriting specimens by the same penman may be paired. For ten of my judges in this test I have record of their success in the matching of undisguised hands. The group is too small to be of much value but the results of the two tests give a coefficient of correlation of .41 (P. E. .18).

The outcome of this aspect of the experiment justifies the distrust on the part of the most careful handwriting experts of the opinion of the ordinary observer as to the genuineness of a given hand. The chance of error is so great that the judgment of the amateur can have little weight, although, obviously, the opinion of one may be worth more than that of another,—a matter which could be determined only by a controlled test. Certainly the confidence with which a witness —or a reagent in the psychological experiment—expresses his opinion bears little relation to his value as an observer and might be most misleading in a trial in court.

Such strictures against handwriting—identification on the part of the amateur only serve to point the value of the work of the expert, with his instruments of precision, his microscope, his enlarged photographs, his multiplication of observations, and his knowledge of where to look for significant variation.

Three of the judges who took part in the test on disguised handwriting were given a second trial at matching after an explanation had been given them concerning the significant and non-significant features of writing individuality. They were advised to ignore changes in size, slant, and form of capitals. Their increased success was as follows: (A) from nine to twelve correct identifications; (B) from six to nine; (C) from five to eight.

So far as the individual disguises are concerned, some were much more effective than others. Three could scarcely be called disguised since they were correctly paired by almost every judge. Of the other twenty-one, four were so well disguised, as to wholly elude capture; eight were identified by only one or two judges each. The remaining nine were correctly paired by from three to seven of the judges.

The three who fail completely at disguise write very individual hands. Their failure was evident to themselves and they made subsequent attempts to mask their writing without much greater success. Of the four completely successful disguises, one is a semi-print style, another is a most clever imitation of a friend's hand included among the specimens, with which it is matched by four different judges. Two others

show very great shifts in slant and size, changes which however easily manipulated seem quite effective in deceiving the ordinary observer. The more conventional and immature hands that approximate a given system cause considerable difficulty in the test.

Calculating the percentage of actual identifications, on the basis of the possible number, for the groups of older and younger subjects respectively (twelve each), we find it 34 percent for the older group and 18.3 percent for the younger. The three reagents who failed completely to disguise their hands all belong to the older groups. Dropping these out and recalculating on the basis of actual to possible identifications we find the percentage of successful identification for the older group is 17.4 and for the younger 18.3 percent.

Calculating the percentage in the same way, but with a division on the sex basis (twelve each), we find the percentage of correct identifications is 22.5 in the case of the women and 30 percent for the men. Again dropping out the three subjects who failed so signally at disguise (two women and one man) and recalculating, the percentages run 10.3 percent for women and 24.7 percent for the men. Our numbers are too small and too greatly affected by individual records to be of great value but so far as they go they indicate that women are more successful in disguise than men, and the younger penmen more successful than the older. All of the four subjects whose disguises were not penetrated were women (one from the older group, three from the younger). Of the eight specimens recognized by only one or two judges, four were written by men (three of the older, one of the younger group) and four by women (three younger group, one of the older). The best records, so far as disguises are concerned, are made by the young women.

The success of the younger group, particularly those writing an immature hand, is not necessarily due to the assumption of another graphic individuality. A return to the conventional system would cause a confusion of such a specimen with others similarly motivated. In a personal letter in which he comments upon the specimens used in the present test Mr. Osborn writes me: "Writing by those who have not long been doing writing outside of school is bound to be similar in many ways and when such writing is disguised its individual features may be modified and its general features remain, which would tend to connect specimens written by different writers." Yet this is not the whole story. In a few disguised specimens there is, very evidently, the assumption of a distinct, yet different,

individuality. The most interesting disguises are those in which there occur such curious changes in style. Some of these disguises come from the older group and lead to the conclusion that an effective disguise is much more a matter of the individual constitution than of age or even sex.

It has been held that ability to shift handwriting individuality is akin to ability in acting. But we have as yet no analysis of what traits characterize the dramatic type. Holt[4] suggests that "The actor's is merely the excessively mercurial and labile character." From my knowledge of my subjects I should say that those showing much facility in the adoption of another chirographic individuality, were, in the main, much more adaptable, more pliable, than the others. There is, however, one rather striking exception to this statement. This reagent—a girl of the younger group—is very visual in type and talented in drawing and fine handicraft. She took pleasure in producing for me an amazing variety of hands. Personally, she is of a distinct and somewhat inflexible individuality who yields slowly to social pressure. She is artistic, rather than imaginative.

Four of the subjects in this test were also reagents in my experiments on control processes in handwriting (R, B, S and D). For these I have a fairly complete analysis of their general procedure in writing. Of the four, two (R and B) were highly successful in their disguise and two (S and D) very inapt. D (the writer of this paper) was particularly poor and that in spite of the fact that she was probably more aware than any other person who attempted the disguise of the tell-tale points in chirography.

It is certainly significant that the alignment of these subjects in the test on handwriting disguise tallies with that found in the earlier experiment. R and B belong to the so-called "motor" group; D and S to the "sensory."[5] Characteristic of the first group was the high degree to which writing was turned over to automatic control; characteristic of the second, was the maintenance of conscious writing control, usually accompanied by a vivid sense of kinaesthetic sensation. For the first two the act of writing is successfully organized and the motor impulse smooth and effective. For the latter there is consciousness of muscular effort in writing and evidence of motor inhibition.

Interpreted on a conventional habit-basis one might perhaps

[4] "The Freudian Wish," 1916, p. 35.
[5] *Loc. cit.*, p. 140f.

expect the first two subjects to be less expert than the other two in disguise of hand. But undoubtedly our conventional views of habit need reconstruction especially along the line of ease in habit-breaking and the relation of this to the mental organization and constitution as a whole. Very possibly the cue to the interpretation must be sought in the smoothness, effectiveness and lack of conflict in the motor impulses themselves, which would facilitate both habit-formation and quick readjustments.

A dramatic reaction to the instruction to disguise one's hand, in which one initiates and then yields confidently to a graphomotor pattern somewhat different from his habitual one, is more effective in disguise than is an effortful disintegration of graphic details, with a constant effort at inhibition of habit. That both kinds of disguise may be successfully achieved is, however, evident. Psychologically and practically they are of differing interest. The effortful disguise although it may conceal its source effectively will give evidence of not being a natural hand by inconsistencies, by retouching, and by the presence of fantastic forms. This type of disguise is, possibly, that most often found in the anonymous letter. The dramatic disguise will be less evidently a disguise and in its most successful forms points to an interesting mental type. It occurs in certain forms of forgery.

Meanwhile we note that Klages cites versatility in the shift of hands as characteristic of the fluidic personality. Graphic virtuosity is evidence of histrionic ability or of the split personality of the hysteric. The subject is worth investigation both in connection with a study of one type of criminal—the forger —and investigation of the hysteric and of the double personality. Several possibilities of application suggest themselves in connection with the study of the handwriting of the normal person.

THE ATTITUDE AND THE REACTION OF THE BUSINESS MAN TO PSYCHOLOGY

According to the plans announced in our previous number (p. 175) we intend to publish under the above heading from time to time communications from the business world concerning the problems that are met and the methods that are used in regard to the human element in business. We have recently received a long and instructive statement from the Employment Department of the National Cash Register Company, from which the following items are abstracted because of their general significance.

Methods of Improving Human Efficiency.

Coincident with a cry for greater efficiency there has developed an ever increasing demand for trained workers, because it is generally recognized that efficiency in its last analysis depends on the man on the job. Developing the system and equipment of a business is comparatively easy. Developing the human side is a task filled with tremendous obstacles. Many large business-concerns are constantly striving to create their own supply of competent workers, which efforts in many cases call for the instruction of the entire force, from the messenger boy to the head of the firm.

The various methods of improving the human efficiency in the present concern involve such educational forces as an employees' reading room equipped with professional and recreational literature, a publication department from which instructive bulletins, leaflets, and pamphlets are issued to the employees at home and "on the road," and an auditorium for demonstrations and lectures, the latter frequently illustrated by lantern slides or moving pictures — on topics related to the industrial and business activities of the firm. Another, somewhat less direct method of educating the employees to higher efficiency is a chain of mottoes framed and suspended in the corridors and workrooms. These mottoes express the greatest thoughts of the greatest men the world has known. Sometimes these mottoes are printed on the pay-envelopes or inserted in the correspondence from the firm to its employees.

One of the great educational forces are the corporation and continuation schools which offer regular class-room instruction in the various business activities, such as typewriting, stenography, business correspondence, commercial mathematics, industrial engineering, and salesmanship. One of the first, if not the first, corporation school in salesmanship was established in 1894, and it is attended regularly by experienced as well as by prospective salesmen. In 1915 a school was held in which newly graduated college men were the pupils. The course covers usually five weeks and three sessions are held each year. There is a regular outlined course of study with written examinations, after the conclusion of which the men are assigned to different districts where they continue to work for some time under close supervision. On different occasions groups of men return to the factory for additional training in order to familiarize them with the industrial processes of production. Department heads and senior clerks are encouraged to attend for four hours the Alexander Hamilton Institute Courses

in business administration, finance, and accounting. Now and then groups of employees are sent on excursions to important industrial and commercial exhibitions, or to salesmen's conventions, or other professional congresses, the firm bearing the larger share of the travelling expenses.

There is also a school for apprentices in the metal trades, which in the near future is to be extended to include three other trades represented in the plant. To this school about forty boys are admitted each fall who have completed at least two years of high-school work. They are first required to stand a test to prove their fitness and given temporary employment during the vacation period between the ending of the second high-school year and the opening of the trade school. This temporary employment is used as a further test of a boy's fitness. The boys who are accepted for apprenticeship work one week and go to school one week alternately. The school is in session five days per week, seven hours per day, for twenty-four weeks, and each boy is indentured for four years. On Saturday morning of each school week the boys report at the factory for special instruction, in order to correlate the school work with the factory work. A special course of studies, giving the boys third and fourth year high-school work, has been arranged, for the satisfactory completion of which full high-school credits may be allowed, so that these boys may receive the regular high-school diploma. After graduation from this high-school two routes are open to the boys. They may continue as apprentices until the expiration of the four years, or until, in the opinion of their supervisors, they have become proficient tradesmen. Those who follow this course will attend a continuation school at least two half days per week. Those who elect the other course now enter the College of Engineering at the University of Cincinnati, remaining there for five years, spending alternately two weeks in college and two weeks in the factory. Both, apprentices and collegiate students are paid for the time spent in the factory.

There are several other more subtle ways by which the efficiency of the human element is being improved but which do not readily lend themselves to description. The requisites of success as summarized by Mr. John H. Patterson are: health, honesty, ability, industry and knowledge of business.

A NOTE ON THE GERMAN RECRUITING SYSTEM

The recruiting system of Germany during peacetimes is based upon a complete and thoroughly systematized index for every youth of military age. This index is obtained in the following way:

Every spring, usually in April, military registration-days are held in all the larger communities of the empire, on which the youths who have passed their seventeenth birthday are obliged to appear at the military registration offices for a thorough examination. When a boy appears there for the first time, he is given a complete physical examination as well as certain sensory tests of vision, hearing, etc. He must also state accurately his occupation, previous school training, family conditions, plans for the immediate future, and furnish other information required of him by the examiners, who are regular officers of the army, army-physicians, and army-clerks.

If the boy seems acceptable, he is required to return for a final examination during the following June, when his previous records are checked up and when he is finally assigned to a certain army-branch. If the boy is not acceptable,—and the great majority usually are not taken in their first year,—he is merely told to return for the second time a year later. At that time he is again fully examined and his previous records are corrected as far as that is necessary. If he is accepted this time, he has to appear for a final rating in the following June, when he is assigned to a certain branch. But many are set back for a third year, when the whole method is repeated as in the preceding years. Whether he is finally accepted or not, he must appear in June for a last re-examination, at which the former decision may be either confirmed or reversed.

The actual entry into the army for service does not begin until the following fall, after the great fall-maneuvers, which are held annually in various parts of the empire. The procedure described above holds true for all boys who have had only a public school education. Those who have completed the *realschule* or who are still attending higher schools may postpone their military service until they have completed their full course of education, including even their university courses. In addition, they also have the privilege of entering the army as "one-year volunteers," which means that instead of the regular two years service in the infantry or cavalry or minor branches (excepting artillery) they may reduce their military service to one year, provided that during this time they support themselves completely and furnish their own military outfits. From their ranks may be drawn the officers of the army, both active and reserve-officers, since their higher education is accepted as a partial preparation for military training.

From this description it appears that by far not all German youths have to serve in the army; only the physically and mentally best fit are required to serve Those falling below certain standards, or being the sole dependents of their family, are thus exempted. For several years after the military service has been concluded, the young men are required to drill annually for several weeks, usually in the fall, in connection with the fall maneuvers. These men constitute what is in peace-times called the "reserves."

As to the selection of each recruit for a given branch of the army,

little is known to outsiders, but certain obvious principles are employed in the selection. For example, the man's occupation is of deciding influence in many cases; farmers' sons are preferred for cavalry and artillery service; the boys along the seacoasts are put into the navy, wherever possible; those who have handled machinery are preferred for the engineering corps or the aviators, etc., which branch includes also many miners. Other requirements are made for men who are selected for the ambulance corps. In peace-times at least these selections are very carefully made, since the recruiting stations have all details of a certain man in well catalogued form, and there is the most systematic cooperation between the various stations, so that a man from one particular part of the country may be assigned to a very distant training camp, because it happens to be short of the kind of men that are wanted for a certain purpose. Of course, there are all kinds of exceptions made to the rule that a man must go to whatever place or branch he is assigned, if good reasons can be given for requesting such an exception.

The office force which is required to keep this vast organization in good functional order is provided entirely by men serving their military terms either as officers or as regulars. If a boy volunteers to spend twelve years in the army, he is (provided he can advance during his first two years of service to a position of non-commissioned officers) given every encouragement to specialize along some particular line, either as a trainer of recruits, or as clerk in some office, or as assistant to higher officers, and the like. At the end of the twelve years, the government provides for him a subaltern position in civil service, and when he gets too old for that he receives a pension. Should he die early, his wife receives a government pension to her death. In this way all the men for the government service in the postal and telegraph as well as in the railroad systems are provided, and frequently the men are given police positions in the larger cities. In this way the government trains and constantly prepares a supply of efficient and loyal men for its various branches, and even in private life a man with a good military record will receive preference by any employer over a man who has not had military training.

BOOK REVIEWS

HUGO MÜNSTERBERG. *The Photoplay, A Psychological Study.* D. Appleton and Company, New York, 1916, pp. 233.

This book is chronologically perhaps the last one of the author's long list of publications, and as such it throws a new and strong light on his theory of values, in particular aesthetic values.

The two chapters of the Introduction deal with the outer and inner development of the moving picture plays. In the first chapter the author shows the historical development of the mechanical devices used in kinematographic machinery, while the second chapter briefly points out the changes in complexity of the picture exhibited, from such a simple view as that of a galloping horse to dramatic performances lasting sometimes several hours. This constantly increasing complexity has, according to our author, been responsible for the birth of a new art, and consequently he tries to prove that the modern photoplay is no longer a cheap substitute for the real drama or a photographic reproduction of theatrical performances. He says: "The art of the photoplay has developed so many new features of its own, features which have not even any similarity to the technique of the stage that the question arises: is it not really a new art which long since left behind the mere film reproduction of the theater and which ought to be acknowledged in its own esthetic independence?"

In order to answer this question the author discusses in the first main part of the book,—entitled the Psychology of the Photoplay and comprising chapters three to six,—the mental means by which the moving pictures impress us and appeal to us, while in the second part,—entitled the Esthetics of the Photoplay and including the remaining five chapters,—he examines first the general aim or purpose which underlies all artistic creation and the general conditions or means of the various arts, and then applies these general principles to a discussion of the means, demands, and functions of the photoplay.

Among the mental means he treats first the induction of illusory perceptions of depth and movement which are due entirely to a peculiar synthetising activity of the spectator's mind and conflict with his true perceptions of the artificial character of the observed scenes. Another mental means largely employed in the photoplay is attention, whose fluctuating, narrowing, and vivifying character is cleverly utilised, redirected, and enhanced by quick shifts of scenery, by emphasis of the pictorial foreground or a sharpening of outlines, and by the "close-up," thereby inducing at will all degrees of mental emphasis. Memory and imagination are likewise utilized, in as much as the order of the pictures is changeable, for they may be reversed, or later events may be anticipated, or interruptions may be introduced by "cut-backs" and the like. The use of the emotions is also very varied. The expressions of the emotions may be modified at will by actors as well as by the camera, in order to produce desired responses in the spectator, and the whole surroundings can be controlled and modified so as to heighten the emotional effect. Here, our author thinks, the photoplay artists, writers of scenarios, actors, and stage-directors, have not yet begun to realize the many psychological possibilities and advantages which their art has over all other arts.

In discussing the esthetics of the photoplay, Münsterberg maintains that true art never imitates nature, but it isolates its objects so that they not only arouse desires and impulses to action, but also satisfy them and thereby please and rest the onlooker. This is accomplished with material characteristically different from the means employed by nature, and therefore the photoplay should not try to approach to nature by removing the lack of color and sound. Its true nature is summarised by the author thus: "The photoplay tells us the human story by overcoming the forms of the outer world, namely, space, time, and causality and by adjusting the events to the forms of the inner world, namely, attention, memory, imagination, and emotion." Nevertheless it is subject to certain laws of esthetics, namely, those of unity of action and unity of characters. Its material may be taken from all natural sources, but it should not be borrowed from other artistic products. The function of the photoplay is as manifold as that of the other arts, but its peculiar charm lies in the fact that it projects or objectifies the mind's own operations in a way not possible to any other art, and therefore it deserves esthetic emancipation and independence.

Although by necessity argumentative in character, the author's style is vivid, forceful and pleasing. The analogies and illustrations are chosen with peculiar aptness, revealing a deep knowledge of the subject and adding greatly to the convincing force of the presentation. There is a suggestion of pioneer rawness in the treatment which, however, is softened by another pioneer characteristic, the vision of distant horizons and higher ideals. L. R. G.

MÜNSTERBERG, H. *Business Psychology.* Chicago, LaSalle Extension University, 1917. pp. XI and 296.

This book is a good presentation of psychology and its results as applied to industry and commerce. It begins by showing the place of psychology in every walk of life, and the place it must hold in business. It lays emphasis on scientific psychology as distinguished from the notions of the soul, so current in popular literature. In business it is what a man thinks, feels and does that is of importance, and this we can find out by studying his mental processes as expressed in bodily movements.

The Second Part of the book deals with "knowledge" and contains discussions on sensations and memory-ideas. A sensation never appears pure. It is always mixed with other sensations either of the same kind or of different kinds. Perceptions of space, time, form, the feeling of awareness and illusions are also discussed. Impressions remain the same in memory as in actual life; a color does not become dull, a sound not weak; there may, however, be a change of vividness. "All our remembering is a renewing of those brain processes which at first are started from our sense organs." But "the individual differences in the ability to renew earlier impressions are very great," and "these differences are of thousand-fold importance in the business world." It is of importance to know how a person learns and remembers in order to make him efficient.

The Third Part is called "Interest" and deals with attention, and feelings and emotions. In the great mass of reality that surrounds us we single out certain facts. "The great means of the mind for this end is the mechanism of attention." "The safest way and the most effective (of securing attention) is that which makes use of the existing dispositions for actions." It "needs frequent changes in order

to stir up ever new reactions." Fatigue affects it; after three or four hours of work it is greatly diminished. The so-called monotony of the work is not so dangerous to attention as the shifting over from one work to another. This wears out the "mental energies" more in making the necessary adjustment. The application of the principles of attention to the problem of selling is important, and the possibilities here great. But since so much depends upon the feelings and the emotions it is necessary to take these into consideration. As the individuals differ it is necessary at first to call forth only a general feeling of pleasantness. A well-proportioned arrangement, charming colors, appeal to the humor, gracefulness and politeness bring the purchaser-to-be into a comfortable mood, and the first point is gained.

Part Four—Activities—deals with impulse and will, suggestion, the acquirement of abilities, the outer and the inner conditions of efficiency. Our so-called will-power is nothing but the tendency of our impressions, perceptions, or ideas to transform themselves into action. A physical act is not at the end when mind takes hold of it; it is inhibited or acted out in an automatic way. The question then is to supply stimuli that call forth the reaction wanted. This might be done by suggestion, which can suppress more or less completely any idea that opposes the action desired. The removal of the opposing idea may take place in one of three ways, or in all three: by re-enforcing the suggested idea, by undermining the opposing idea or by heightening the suggestibility of the subject. This can be done only by experience and by observing one's own former mistakes.

Both outer and inner conditions effect productivity to a great extent. It seems trivial that such a small matter as a quarter of an inch on the length of a sewing needle or one inch on the height of a chair should make any difference in the amount of a day's work, and still it does. An overfatigued, an intoxicated, or an emotionally upset mind produces unsatisfactory results.

Part Five—Individual Differences—deals with the problem of finding the right man for the right position. This becomes important, if we consider "that in a well-known steel mill 26,000 workers pass annually through the institution in order to maintain an average working force of 8,000." For this reason vocational bureaus have been established with good results. Psychology is now ready to contribute something to the solution of the problem. The so-called group psychology and correlation psychology can be used to a certain extent. Graphology and phrenology must be discarded altogether. The Blackford plan falls short in many ways. Consequently "the well-selected mental test experiments constitute the only method by which the mental fitness of men for special work can be found out beforehand in a reliable way." In the meantime some practical tests may be performed on the sensation, perception, memory, association, attention, feelings, and reaction time. A man might improve himself, but he remains essentially of the type that he belongs to, and the sooner he recognizes that, the better it is for him and for society, which may have a place for that type to which he belongs.

The first half of the book deals with psychology and the second half with its application to industry and commerce. For the psychologist there is nothing new in the book, and while the author presents the problems fairly, nevertheless conveys the impression that they are simpler than they are in reality. It is a popular presentation of the subject.

KARL J. KARLSON.

GANTT, H. L. *Work, Wages, and Profits.* Second Edition Revised and Enlarged. The Engineering Magazine Company, New York, 1916. pp. 292 and index.

The author of this work is a well-known expert in factory management, at one time associated with the late F. W. Taylor, and for years connected with the Midvale Steel Company. His book is made up of chapters delivered as addresses at business schools or elsewhere and published separately, for the most part serially in *The Engineering Magazine*. The first edition appeared in 1910, the second in 1912. The present issue is a revision and enlargement of the second. The increase of fifty per cent. in the size of the work has not resulted in a corresponding increase in the value, for the three new chapters either restate or illustrate the general principles.

Clear in statement and ample in particular instance, the book is the expression of optimism in industrial life where many have seen but a return to economic enslavement and personal degradation. This optimism is made to apply to both employer and employee; but the interest of the author is unquestionably that of the business man rather than of the workman. "The ratio of what can be done to what is done is even greater than three to one in work requiring skill and planning." Any suggestions that lead to so marked an increase in production are welcome, but the crying need of normal times is not greater production but a more equitable division of products, in short, higher wages.

Mr. Gantt is not so far out of harmony with his age, nevertheless, as to neglect the subject of higher wages. It is his belief, however, that greater production means higher wages. Accordingly, he devotes all his energies to a study of efficiency, not of machinery but of workmen. For the trade union he would substitute an efficient system of utilizing labor. The business man should employ such experts as Mr. Gantt to study the best methods of work. Laborers should be carefully supervised, gradually trained, and finally rewarded according to the labor performed.

Pay the best men well on a piece-work basis; the others you may leave on day work. Reward foremen for instructing the workers. Make all rewards permanent. Work according to carefully planned tasks and schedules.

"Buying labor is one of the most important operations in modern manufacturing." High wages mean, not greater well-being, higher culture or safer democracy, but lower cost and accordingly greater profits.

The assumptions regarding human nature apply more to the skilled than the unskilled worker. "A task has a psychological effect which is very striking." "Habits of industry are far more valuable than any kind of knowledge." Intelligent men are interested in learning. Earning a greater reward holds the interest and therefore lightens the task; but we may ask whether this holds good indefinitely. Learning to obey is bound up with close supervision. There is a general moral tonic that comes from the need of co-operation, for one man sees that if he does not do his share of a process his fellow-worker suffers.

To the educator, to the psychologist, to the student of civilization, this emphasis upon training in economic efficiency, comparable somewhat to the old apprenticeship and the modern technical school, is of absorbing interest. Alongside of education for citizenship we are to have education in the efficient production of material goods. Training men to work to advantage has been difficult and painful. Slavery, serfdom and the factory system have been landmarks in the process.

To the slave-driver, the lord's bailiff, and the efficiency expert have been given the unheroic but apparently necessary parts in the drama of taming man. The lazy, improvident and wasteful Adam has become No. 999 working under the stop-watch. N. S. B. GRAS.

JOSEPH A. MOSHER. *The Essentials of Public Speaking.* The MacMillan Company, New York, 1917. pp. xv and 207.

Professor Mosher's book aims to embody in clear and concise form the essentials of practical extempore speaking. It does not aspire to the rank of a work on oratory, but is confined to the more restricted area of practical address, calculated to minister to the requirements of the great body of students, teachers, lawyers, doctors, business men, and similar people who need to express their ideas clearly, forcefully, and practically. The author explains that the book is the outcome of his experience in helping men—students, business and professional men—to develop their ability to speak effectively.

This restriction of the scope of the volume constitutes both its merits and its limitations. The reviewer will hazard the guess that in its preparation Professor Mosher had chiefly in mind the needs of the busy professional man whose time and patience alike are more closely bounded than those of the college student. His problem accordingly turns out to be to compress into two hundred pages the guiding rules of extempore speaking, with explanation and illustration enough to make them carry over into the resulting work of the reader. Needless to say, this is no easy task; but one cannot avoid the feeling that at times brevity has overreached itself. For instance, on page sixteen we find the following discussion of the proper function of the conclusion.

"Rounding Out the Speech

"The speaker should aim in the conclusion to convey the impression of completeness, of having rounded out the address in a finished and satisfying manner.

"II. Clinching the Central Idea

"The conclusion also affords an opportunity for a final embodiment of the speaker's message in such concise and untrammeled form that his listeners will carry the essentials away with them.

"III. Arousing Enthusiasm and Exhorting to Action

"Finally, the speaker should try, whenever the nature of the subject warrants it, to arouse enthusiasm for the views set forth. Although ever mindful of the emotions of the audience, the speaker has aimed chiefly in the development to appeal to the mind, to convince. Now, having established the foundation of conviction, he is in a position to appeal more directly and intensely to the emotions. At this point is afforded, also the best opportunity to appeal for action in case such a response is desired."

This excerpt serves to illustrate an admirable feature of the book—its headings and sub-headings. There is seldom any doubt concerning what the author is doing from beginning to end, for his subject matter has been carefully classified and subdivided, and has been clearly summarized at the end of each chapter. The author may also be congratulated on his choice of illustrations. Although some of our old friends appear, notably Burke's Conciliation Speech and Lincoln's Gettysburg Address, fresh material and a new generation of speakers enliven many of the pages, for instance, President Wilson, Henry Van Dyke, Ex-Governor Hughes, Mr. John D. Rockefeller, Jr., speaking to the employees of the Colorado Iron and Fuel Company, and G. Lowes Dickinson on the League to Enforce Peace.

A teacher of public speaking who has been especially interested in argumentation (which indeed comprises most public speaking, and which is most often in the mind of the author in writing this book, will be inclined to regret that the student is left, in the discussion of the preparation of the speech, with only an outline, and is not furnished with even the essentials of a brief. An outline, such as printed on pages 94 and 95, tends too easily to suggest exactly that "inconsequential series of ideas" which Professor Mosher deplores on page 105. A brief is the most effective remedy for this very common fault in public speaking.

The reading of the Essentials of Public Speaking emphasizes anew the part which the instructor plays in any course on oral address. No text-book has been, and it is safe to say, no text-book will be, written which will take the place of a careful and sympathetic instructor. But those who wish a brief account of the essentials of extempore speaking will not go astray if they consult Professor Mosher's volume.

L. D. WHITE.

WILLIAM STERN. *The Psychological Methods of Testing Intelligence.* Translated from the German by Guy Montrose Whipple. Warwick and York, Baltimore, 1914. pp. X and 160.

The author in the preface states the general purpose of the book. Intelligence testing is one of the most promising fields of applied psychology, using that term in the strictest sense. "For this reason I wanted to make this survey of it accessible to wider circles of readers outside the psychological profession, especially to teachers of normal and of backward children, to school administrative authorities, to school physicians, to specialists in nervous and in children's diseases, and to those engaged in child welfare work."

The author begins with the nature and problem of testing intelligence, dividing this section into a treatment of Intelligence and Intelligence Testing and Practical Problems of Intelligence Testing. He defines Intelligence as "A general capacity of an individual consciously to adjust his thinking to new requirements; it is general mental adaptability to new problems and conditions of life." The author gives a timely warning that psychological tests must not be overestimated, as "if they were complete and automatically operative measures of mind. At most they are the psychographic minimum that gives us a first orientation concerning individuals about whom nothing else is known, and they are of service to complement and to render comparable and objectively gradable other observations—psychological, pedagogical, medical—not to replace these."

He then discusses the single tests and series of tests, devoting a section to the inadequacy of the single test. The monograph is largely a treatment of the method of age—gradation (Binet-Simon method). The author compiles the results of many of the investigations in which the Binet-Simon method has been used and subjects it to criticism, offering suggestions for the improvement and reorganization of some of the tests. The last section of the book is devoted to the estimation and testing of finer gradations of intelligence (with the aid of the method of ranks). This section has a very practical bearing on school work. It should be said that the Bibliography is complete, considering the fact that the book was written in 1912.

Stern's monograph is a most valuable contribution to applied psychology, and Whipple's excellent translation of it should be very warmly received by all interested in mental testing.

University of Illinois. JOHN A. STEVENSON.

ELLSWORTH HUNTINGTON. *Civilization and Climate.* New Haven: Yale University Press, 1916, 2d edition, xii+333 pp.

In an investigation of the influence of climate upon civilization, Dr. Huntington brings forward evidence from various sources,—from his explorations in Turkestan, in Mexico, in Central America and elsewhere; from his statistical studies of the weekly output of factories and of the weekly grades obtained by students in the classroom; and in numerous instances he cites from the work of other investigators. This mass of evidence indicates that climate is an influential factor in determining what degree of civilzation shall obtain in a given region. Migration to a less stimulating climate leads to a decrease in mental and physical energy; and this in turn gives rise to a decreased resistance to disease, and to a lesser efficiency in overcoming difficulties and in adapting to new conditions. Even in a given region, physical strength and mental efficiency are found to vary with the climatic changes of the seasons.

In numerous instances, however, ruins of ancient cities show that at one time civilization flourished in regions where the climate is now so arid that life is difficult. The author meets this apparent objection to his general view by citing evidence to show that climates have changed with the lapse of time. He advances a 'pulsatory hypothesis' which holds that the past was in general more moist than the present and that alternations of moist and dry have recurred in great cycles. An examination of the annual growth of trees (as revealed in cross-sections of the Sequoia trees of California, some of which are more than three thousand years old) supports this hypothesis. There seems reason to believe, for instance, that the beginning of the Christian era was moist and that the seventh century was dry; and that at times when the climate of a given region was favorable, the inhabitants possessed a maximum of virile energy.

The author presents a number of maps showing the present distribution of civilization. These maps are based upon replies received from one hundred and thirty-seven geographers, anthropologists and others who had been asked to assign values to various geographical regions indicating their rank as contributors to civilization.

A chapter which is of special interest to readers of this Journal reports the results of a statistical investigation of weekly variations in the efficiency of factory operatives and of students. The operatives were selected from factories in Connecticut, Pennsylvania, Georgia and Florida. All of their tasks demanded speed and accuracy, but they included such diverse activities as the polishing and packing of hinges, the making of cigars, the assembling of parts of motors, etc.; and since it was all 'piece-work' one seems justified in inferring that the operatives worked at approximately maximum efficiency throughout. It was found that efficiency varies with the seasons, rising to a maximum in the spring and again in the fall; and sinking to a minimum at midsummer and again at midwinter. A survey of the weekly averages obtained by students at Annapolis and West Point shows a similar variation of mental efficiency with the seasons.

Dr. Huntington's book is a valuable contribution to the literature. The author displays a high degree of ingenuity and insight in the discussion of his problems; and he marshals his evidence in convincing fashion. The book should be read by every student of applied psychology.

Clark University. J. W. B.

SUMMARIES

WALTER B. SWIFT. *A Psychological Analysis of Stuttering.* Journal of Abnormal Psychology, October-November, 1915. *Studies in Speech Disorder, No. 5, The Speech in Athetosis.* Review of Neurology and Psychiatry, April, 1916. *The Possibility of Voice Inheritance.* Review of Neurology and Psychiatry, March, 1916.

In the first article the author shows that a complete, automatic visualization process may be developed by vocal drill in cases where previously there was total absence of all these visualization processes during speech. In relation to the stuttering, the symptoms disappeared in proportion as the picturing processes developed. This may therefore be considered as the "new treatment indicated" in the article in the Journal of Abnormal Psychology. I next plan to present a long series of such cases so treated, presenting both the original absence of picturing and its final development. By that time I think I will be ready to give out my system of treatment in final form.

The second article shows that athetoid speech is a constant variation in vowel form and consonant sound, clear only when correctly struck during the constantly changing contractions, or when, during rare moments of relaxation, the sounds are hit before contractions occur.

In this paper I claim abundant evidence to show the possibility of voice inheritance. (1) Literature on eugenics and cacogenics shows that bone shapes are probably inherited. (2) The nose of the Indians, and the Greeks, and the Jews, prove this pretty conclusively. (3) The lower animals afford data that put this thesis beyond doubt. Thus it is proved that bone forms are inherited. Then what is contained in them is also inherited, and therefore the functions that those cavity shapes subserve, such as vocal quality and utterance, are likewise inherited.

W. B. SWIFT.

J. E. W. WALLIN. *Criminal Irresponsibility.* Journal of Delinquency, Vol. 1, November, 1916.

The author shows that the misuse of the plea of moral irresponsibility on the basis of "temporary insanity" or "emotional insanity" or the like has started a reaction among legal and lay students of crime against the axiom of treating irresponsible criminals primarily as irresponsible and only secondarily as criminal. The difficulty has been rather enhanced by extending the meaning of such terms as feeble-mindedness, criminal imbecility, insanity, and psychopathic constitution. The author states that "it has not yet been conclusively shown that alleged 'feeble-minded persons' with Binet mentalities of from X to XII are incapable of forming moral judgments, of understanding the qualities of right and wrong acts, and of choosing right acts and of avoiding wrong acts." He agrees with Tredgold's concept of feeble-mindedness and believes that "in the end, we shall make greater and more permanent progress, if we err in the direction of conservatism, and if we suspend judgment on moot questions pending the accumulation of further experimental data."

L. R. G.

EDWARD K. STRONG, JR. *The Factors Affecting a Permanent Impression Developed Through Repetition. Journal of Experimental Psychology*, Vol. 1, August, 1916.

The experiments reported in this article were made with full, half, and quarter page advertisements arranged in four dummy magazines in such a way that each advertisement was seen four times. These four repetitions occurred in the first set of tests at the same sitting, in the second set, at intervals of one day, in the third set, at intervals of one week, and in the fourth set (previously reported in the March, 1914, *Psychological Review*), at intervals of one month. The same advertisements were then rearranged among a group of new advertisements, and four weeks after the first exposure (except in the case of the fourth set, when the second exposure occurred sixteen weeks afterwards), the same people were tested to determine how many of the first class of advertisements were recognised as having been seen repeatedly before. The problem was to find out the relative value of size, frequency, and time-interval for producing the most lasting effect on the reader's memory. The number of observers for the four sets of experiments varied between 18 and 25, totalling 38 men and 48 women.

Among the many significant results the following are pointed out as of special interest. The first presentation is more effective for large than for small advertisements, that is, the smaller profit more by repetition than the larger. The time-interval of a few minutes between repeated presentations has the greatest effect upon the full page, and the least effect upon the quarter page advertisement. The interval of one month is the least favorable regardless of size. With regard to size, the results of a previous investigation were confirmed which indicated that "the attention-value of space increases approximately as the square-root of the increase in area" and sometimes as much as 25 or 30% more. Another fact previously established was confirmed, namely, that "the same total amount of space is more effective when used in large amounts than when used in small amounts but more frequently." More important than size, repetition, and length of time-interval between repetitions is the factor of the number of advertisements seen at one time; the larger this number, the less permanent is the impression received from any one of them. L. R. G.

AGOSTINO GEMELLI. *The Application of Psychophysical Methods to the Examination of Candidates for Aviation-Service.* (With four illustrations, thirteen diagrams, and four tables). *Rivista di Psicologia*, August, 1917.

This research was carried on during 1916 in the Italian war-zone, under the auspices of the Minister of War, and reported at the Congress of the Society of Scientific Progress, April, 1917. The present article is mostly a description of the methods employed, with a few results given mostly as illustrations of what can be expected from the methods. The latter consist of two parts, the ascertainment of the psychical profile according to Rossolimo, and the graphic records of circulation, respiration, and blood-pressure taken before, during, and after flights. Rossolimo calls for the measurement of sensory, muscular, and mixed reaction-times to visual, tactual, and auditory stimuli, which were obtained both before and after flight. The latter show uniform retardations of from 6 to 45 sigma with frequently much smaller mean variations. The "emotional resistance" was tested by pneumographic and plethysmographic records while hearing stimulus-words referring to events connected with aviation, and especially to

personal experiences of that kind. Other tests required by the Rossolimo profile were measures of concentration and range of attention, of the capacity to recognize accurately, to judge quickly, to reproduce well, and to perceive colors, and of general powers of observation. A maximal score of ten points may be obtained in each of these twelve items, and a curve of the actual scores obtained represents the "psychical profile." Five samples illustrate the ideal type, the partial, and the complete failure.

Especially interesting are the results of the changes in circulation, respiration, and blood-pressure during various stages of flying and at altitudes to well above three thousand meters, which are illustrated by eight diagrams. From these data the author draws the conclusion that candidates for aviation should be free from the slightest traces of irregularities, from symptoms of diathesis which predispose the individual to quick and sudden changes in circulation and respiration or which lower his "emotional resistance." Other results showed that even short flights to low altitudes result in marked mental exhaustions with all classes of aviators, the most experienced not excepted. This fact may account for many accidents which are otherwise unexplainable. The author places no faith in retrospective accounts by aviators of their personal experiences during flying, for several reasons. He is continuing his experiments and perfecting apparatus for giving more reliable records during flight. L. R. G.

The following books have been received:[1]

GEORGE THOMAS WHITE PATRICK. *The Psychology of Relaxation.* Houghton Mifflin Company, Boston, 1916.

MARY E. THOMPSON. *Psychology and Pedagogy of Writing.* Warwick and York, Inc., Baltimore, 1911.

MEYER BLOOMFIELD. *The Vocational Guidance of Youth.* Houghton Mifflin Company, Boston, 1911.

IRVING R. ALLEN. *Personal Efficiency, Applied Salesmanship, and Sales Administration.* LaSalle Extension University, Chicago, 1915.

HARRINGTON EMERSON. *The Twelve Principles of Efficiency.* Fifth Edition. The Engineering Magazine Company, New York, 1917.

HERBERT J. HALL and MERTICE M. C. BUCK. *The Work of Our Hands.* Moffat, Yard and Company, New York, 1915.

H. ADDINGTON BRUCE. *The Riddle of Personality.* Moffat, Yard and Company, New York, 1915.

HENRY FOSTER ADAMS. *Advertising and Its Mental Laws.* The MacMillan Company, New York, 1917.

ROBERT S. CARROLL. *The Mastery of Nervousness Based upon Self-Reeducation.* The MacMillan Company, New York, 1917.

H. L. HOLLINGSWORTH and A. T. POFFENBERGER. *Applied Psychology.* D. Appleton and Company, New York, 1917.

[1] Mention here does not preclude further comment.

NOTES

The following is a complete list of APPOINTEES FOR PSYCHOLOGICAL EXAMINING IN THE NATIONAL ARMY reported October 1, 1917, by Professor Yerkes, Major in the Sanitary Corps and Chairman of the Psychology Committee of the National Research Council, Washington, D. C.:

(1) Staff of section of Psychology in Office of the Surgeon General, Washington: Major Robert M. Yerkes in charge of section, Lieut. Arthur S. Otis in charge of statistical work of section.

(2) Lieutenants Clarence S. Yoakum, Marion R. Trabue, Jos. W. Hayes and Wm. S. Foster to serve as Chief Psychological Examiners in Camps Lee, Taylor, Dix and Devens respectively.

(3) The following to serve as Psychological Examiners with rank of Lieutenant in Sanitary Corps:

In Camp Lee—George O. Ferguson, Jr., Walter S. Hunter and Edward S. Jones.

In Camp Taylor—Karl T. Waugh, Heber B. Cummings and Edgar A. Doll.

In camp Dix—Harold A. Richmond, Herschel T. Manuel and Carl C. Brigham.

In camp Devens—John E. Anderson, Horace B. English and John T. Metcalf.

(4) In addition to the above commissioned examiners the following men have been given civil appointment for psychological examining:

In Camp Lee—Leo T. Brueckner, Donald D. Paterson, A. S. Edwards, Rudolph Pintner, Benjamin F. Pittenger and Ben D. Wood.

In Camp Taylor—James W. Bridges, J. Crosby Chapman, John K. Norton, Eugene C. Rowe, J. David Houser and C. P. Stone.

In Camp Dix—Thomas H. Haines, Norbert J. Melville, H. P. Shumway, Thomas M. Stokes, John J. B. Morgan and C. C. Stech.

In Camp Devens—Raymond H. Wheeler, Harold C. Bingham, Carl R. Brown, Chester E. Kellogg, Ralph S. Roberts, and Charles H. Toll.

Summary Report from Psychology Committee of the National Research Council for the Director of the Council of National Defense.

During the past month the activities of the Psychology Committee have greatly increased, both in variety and extent. The following list includes the most noteworthy lines of work:

(a) Perfecting of methods and plans for the Psychological Examining of enlisted men in four National Army Cantonments. In each cantonment a staff of ten psychologists, assisted by fifty or more enlisted men detailed from the ranks, will, during October and November, systematically examine the thirty to forty thousand enlisted men in the camp. It is believed that the Psychological Examining will result in the elimination of from one to two per cent of men who by reason of mental defect are unfit for military service; that in the second place it will supply company commanders with invaluable information concerning the intellectual ability and probable serviceableness of their men.

(b) As a development from the work of the Psychology Committee, a Committee on Classification of Personnel has been organized in the

War Department. This consists of a number of scientific men chiefly psychologists and employment experts, working in coöperation with representatives of the various bureaus of the War Department.

To this committee various problems of personnel have already been referred by the Department.

In each National Army Cantonment, a personnel officer, with the rank of captain, has been appointed and supplied with suitable facilities for securing information concerning the occupational training and experience of every man. This information is obtained immediately on report of the man to the camp. The personal record cards are filed in the central office at or near Division Headquarters and are already being systematically used by Division Staff officers in the assignment of men for special kinds of service. Everything indicates that this systematic handling of the vocational problem in connection with military service will result in greatly increased efficiency and personal satisfaction to enlisted men.

The Committee has also undertaken to assist the Signal Corps in the organization of examining boards and methods for the selection of men to be commissioned in aviation service. Several psychologists have already been recommended for commissions as captains in the Signal Corps to aid in this way.

Certain members of the Committee are coöperating with the Quartermaster Department in the development of plans for the classification and assignment of men from the Officers' Training Camp of the Quartermaster Corps.

The work initiated by Dr. Scott in the first series of Officers' Training Camps has been ordered continued and extended to all of the second series of camps. It involves the use of personal record sheets which supply ratings of individuals on the basis on which selection for commissions may be made.

(c) Work initiated by Dr. Dodge of the Psychology Committee, directed toward the development of methods of selecting men for various kinds of naval service, has continued and been extended in various directions. One group of "Dodge Methods" of measurement has recently been ordered to use on the main fleet.

There are various other subsidiary lines of psychological service more or less directly related to military activities. In general it may be said that from the organization and early work of the Psychology Committee of the National Research Council have already developed many more lines of fruitful and apparently immediate serviceable endeavor than the members of the committee dreamt of.

Respectfully submitted,

ROBERT M. YERKES,
Major Sanitary Corps, Chairman Psychology Committee
National Research Council.

ED.—As a supplement to the report given above we hope to print in our next issue detailed statements about the work of the various subcommittees mentioned under (b) and (c), especially of the Personnel Committee represented by Professor Bingham, of the work in connection with naval service, by Professor Dodge, and with aviational service, by Professor Watson.

Doctors Arthur S. Otis and Truman L. Kelley have been appointed members of the psychological staff in the Office of the Surgeon General with special responsibility for statistical work and the revision of methods of examining.

The Committee on Classification of Personnel in the Army has been appointed by Secretary Baker and placed under the jurisdiction of the

Adjutant General. This Committee has organized and is directing the occupational census and classification of the men in the National Army; has installed in the second series of Reserve Officers' Training Camps the system of personal records and ratings by which the men will be selected for commission; has coöperated with the Signal Corps, the Quartermastsr Corps and other arms of the service in preparing application forms, qualification records, and other aids in sifting and assigning personnel; and has stimulated research on qualifications desired in aviators and on tests for selecting recruits to be trained for special duties. On the scientific staff of the Committee are the following psychologists: Walter Dill Scott, Director; E. L. Thorndike, Chairman; W. V. Bingham, Executive Secretary; James R. Angell, R. Dodge, R. B. Perry, J. F. Shepard, E. K. Strong, Jr., J. B. Watson, R. M. Yerkes, L. M. Terman. Dr. Terman gives up his work with the Committee to return to Stanford University October 1. Dean Angell has leave of absence from the University of Chicago and will be in Washington until January 1. The other members of the Committee are all giving part or full time to the work in Washington. They have the coöperation of R. C. Clothier, H. L. Gardner and sixteen other employment managers, of several army officers, and of a few volunteer assistants.

The Bureau of Education at Washington has recently issued a Bulletin, 1917, No. 9, on *Department-Store Education, an Account of the Training Methods Developed at the Boston School of Salesmanship under the Direction of Lucinda Wyman Prince*, by Helen Rich Norton, Associate Director, School of Salesmanship, Women's Educational and Industrial Union, Boston, Mass., from which the following extracts may prove of general interest to the readers of this JOURNAL:

The purpose of the Boston School of Salesmanship is fourfold: (1) "to make advancement in the profession of selling depend on efficiency and not on years of service," (2) "to increase the pupil's (intellectual) power and judgment," (3) "to discover whether or not a girl is fitted for the vocation of selling," and (4) "to give the girls worthy standards of all kinds." The course of study includes the subjects of salesmanship, textiles, general merchandise, hygiene and physical education, arithmetic, store system, English, color, and design. In 1909 a class for teachers of salesmanship was inaugurated which in 1913 became affiliated with Simmons College. The members of this class devote their mornings to the observation of the methods of teaching, practice teaching, individual coaching and a conference with the director. The afternoon sessions are devoted to the study of applied psychology, education, textiles, and economics or welfare work from an economic standpoint.

The course in applied psychology consists of the following work: "Ordinary business situations are examined in order to analyze out of them some of their psychological principles. The work involves a review of the fundamental principles of psychology, an application of these principles to various department store methods, and a study of the increased efficiency in department store transactions that may be developed through the conscious application of psychological principles."

The success of the whole undertaking was so remarkable that Mrs. Prince, the director of the school, was asked to introduce the teaching of salesmanship in some of the Boston high-schools. In 1916 ten high-schools offered such a course which was attended by about 800 girls. In a similar manner courses of salesmanship have been introduced in the evening classes of the continuation schools.

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Directory of American Psychological Periodicals

American Journal of Psychology—Worcester, Mass.: Florence Chandler.
Subscription $5. 600 pages annually. Edited by G. Stanley Hall.
Quarterly. General and experimental psychology. Founded 1887.

Pedagogical Seminary—Worcester, Mass.: Florence Chandler.
Subscription $5. 575 pages annually. Edited by G. Stanley Hall.
Quarterly. Pedagogy and educational psychology. Founded 1891.

Psychological Review—Princeton, N. J.: Psychological Review Company.
Subscription (with Psychological Bulletin) $6. 480 pages annually.
Bi-monthly. General. Founded 1894. Edited by Howard C. Warren.

Psychological Bulletin—Princeton, N. J.: Psychological Review Company.
Subscription $3.25. 480 pages annually. Psychological literature.
Monthly. Founded 1904. Edited by Shepherd I. Franz.

Psychological Monographs—Princeton, N. J.: Psychological Review Company.
Subscription $4. per vol. 500 pages. Founded 1895. Edited by James R. Angell.
Published without fixed dates, each issue one or more researches.

Psychological Index—Princeton, N. J.: Psychological Review Company.
Subscription $1.25 200 pages. Founded 1895. Edited by Madison Bentley.
An annual bibliography of psychological literature.

Journal of Philosophy, Psychology and Scientific Methods—New York:
Sub-Station 84. Bi-weekly. 728 pages per volume. Founded 1904.
Subscription $3. Edited by F. J. E. Woodbridge and Wendell T. Bush.

Archives of Psychology—Sub-Station 84, New York: Archives of Psychology.
Subscription $5. 600 pp. annually. Founded 1906. Edited by R. S. Woodworth.
Published without fixed dates, each number a single experimental study.

Journal of Abnormal Psychology—Boston: Richard G. Badger. Subscription $4. 480 pages annually. Ed. by Morton Prince. Bi-monthly. Founded 1906.
Entire field of abnormal psychology.

Psychological Clinic—Philadelphia: Psychological Clinic Press.
Subscription $1.50. 280 pages annually. Edited by Lightner Witmer.
Monthly (9 numbers). Orthogenics, psychology, hygiene. Founded 1907.

Training School Bulletin—Vineland, N. J.: The Training School.
Subscription $1. 160 pages annually. Ed. by E. R. Johnstone. Founded 1904.
Monthly (10 numbers). Psychology and training of defectives.

Journal of Race Development—Worcester, Mass.: Louis N. Wilson.
Subscription $3. 460 pages annually. Founded 1910. Quarterly.
Edited by George H. Blakeslee and G. Stanley Hall.

Journal of Educational Psychology—Baltimore: Warwick & York.
Subscription $3. 600 pages annually. Founded 1910.
Monthly (10 numbers). Managing Editor, J. Carleton Bell.
(Educational Psychology Monographs. Edited by Guy M. Whipple.
Published separately at varying prices. Same publishers.)

Journal of Animal Behavior—Cambridge, Mass.: Emerson Hall.
Subscription $5. 450 pages annually. Founded 1911.
Bi-monthly. Robert M. Yerkes, Managing Editor.

The Behavior Monographs—Cambridge, Mass.: Emerson Hall.
Subscription $5. 450 pages per volume. Edited by John B. Watson.
Published without fixed dates, each number a single research.

Psychoanalytic Review—Washington, D. C.: 3617 Tenth St., N. W.
Subscription $5. 500 pages annually. Psychoanalysis.
Quarterly. Founded 1913. Ed. by W. A. White and S. E. Jelliffe.

Journal of Experimental Psychology—Princeton, N. J.: Psychological Review Company. 480 pages annually. Experimental. Founded 1916.
Subscription $3.25 Bi-monthly. Edited by John B. Watson.

Journal of Applied Psychology—Worcester, Mass.: Florence Chandler.
Subscription $4. 400 pages annually. Quarterly. Founded 1917.
Edited by G. Stanley Hall, John Wallace Baird and L. R. Geissler.

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